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Delivered at the University of Edinburgh, May 19th and 20th, 1926,

BY RUDOLPH MAGNUS,

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PART I.

THE study of the physiology of movement is of old origin. Movement affords many points of attack for research because by movement changes in the condition of the body or its parts occur, which attract the attention of the observer and can be recorded and measured. This is not the case when posture is studied. Here we have to deal with a constant condition without apparent changes, so that our desire for causality is not stimulated, and we therefore do not immediately suppose that active processes are at work. In consequence of this the physiology of posture is of relatively recent date and many facts to be described in these lectures have been discovered by still living physiologists during the last 40 years, among whom Sherrington must be named in the first place. The chief result of these investigations is that posture is an active process, and is the result of the coöperation of a great number of reflexes, many of which have a tonic character. Many parts of the central nervous system contribute to the function of posture; the importance of the spinal cord and the brain-stem we understand up to a certain limit, whereas the activities of other parts, especially of the cerebellum and basal ganglia, are still obscure.

For the purpose of these lectures I class postural activities under the following headings:—

1. *Local static reactions*, in which only one part of the body—e.g., one limb—is concerned.

2. *Segmental static reactions*, which involve one segment of the body—e.g., both hind-limbs, both fore-limbs, or the neck.

3. *General static reactions*, in which more than one segment or even the whole body comes into action.

The aspects of these general static reactions vary considerably in accordance with the part of the central nervous system which governs in different experiments the posture involved. We can thus distinguish: (*a*) static reactions of the oblongata animal (decerebrate preparation), in which the spinal cord is in functional connexion with the medulla oblongata only; (*b*) static reactions of the mid-brain and thalamus animal, in which in addition to the bulb the mid-brain centres also take an active part; (*c*) static reactions of the intact animal, in which the cortical centres coöperate.

The importance of the cerebellum and of the basal ganglia will not be discussed in these lectures.

LOCAL STATIC REACTIONS.

The limbs of mammals, as of other vertebrates, are built up of bony segments, linked by a complicated arrangement of ligaments and moved and fixed by muscles; fasciæ also play a role. The whole system is easily movable in different directions. Our problem is to explain how such a movable limb is at times used as an *instrument* for very different purposes (such as scraping, scratching, fighting, &c.) and moved freely in all joints, whereas at other times it is transformed into a stiff and strong *pillar*, which gives the impression of being one solid column, able to carry the weight of the body. Experiments have shown that this is accomplished by a series of local static reflexes.

We were confronted in the laboratory with this problem during the investigation of decerebellated animals, which had been operated upon by Dr. G. G. J. Rademaker, and of which the condition of muscle-tone had to be followed during the course of many months. It soon became evident that this was not a simple task, and that the state of tone of a limb at any given moment depended greatly upon the way in which the tone is investigated. If, for instance, a dog is lying down in the lateral position and the resistance of one fore-limb against passive flexion is measured with the hand and fingers flexed, often no resistance can be felt. But if the latter are extended and pressure exerted against the pads of the foot, then the fore-limbs become strongly extended and can hardly be flexed at all. The same difference can also be demonstrated in intact animals. We therefore decided to make a more detailed investigation of these reactions. In addition to Dr. Rademaker, Dr. R. Schoen (Würzburg) and Dr. E. A. Blake Pritchard (London) took part in this research, Dr. Schoen experimenting on the general conditions for these reflexes and on a graphical analysis of the muscles of the fore-limbs, while Dr. Pritchard investigated the hind-limb in the same way.

The best way to evoke this static reflex is to press against the pads of fingers or toes and to dorsiflex the hand or the foot. Then the limb becomes more or less stiff, and is, in the prone position of the animal, able to carry the weight of the body.

Two different stimuli coöperate in evoking this reflex:

1. The *proprioceptive* stimulus evoked by the dorsiflexion of the distal parts of the limbs (fingers and hand, toes and foot). These proprioceptive influences can be isolated by cutting the local sensory nerves for the skin of hand and foot. They disappear after cutting the tendons of all plantar or volar flexor muscles to the distal part of the limb.

2. The *exteroceptive* stimulus evoked by the contact of the pads of the feet with the ground. If a decerebellated dog be placed in the supine position with the head ventroflexed by 90°, then the hind-limbs are usually flexed in all joints. A very slight touch to the pads of the foot is sufficient to evoke a strong tonic extension of the whole hind-limb, even if dorsiflexion of foot or toes is carefuly avoided by keeping the fingers only just in contact with the foot. It appears as though the slowly extended foot were being drawn after the receding finger by some magnetic force. The reflex has therefore been called the "magnet reaction." As soon as the finger is removed, the limb goes back into flexion. The exteroceptive stimulus can be isolated by cutting all the tendons to the foot or hand and disappears only after severing the sensory cutaneous nerves to the foot.

The static response ends and the whole limb is loosened and becomes free for movement by the removal of the two above-named stimuli, which takes place as soon as the limb in the standing animal is lifted from the ground; but, as is usual in very important functions, an active process coöperates. As soon as the distal part of the limb is flexed in the volar or plantar direction, the limb is reflexly loosened and prepared for movement.

We call the whole process the *supporting reaction*. The passing from the flexible condition to the stiffness of a support is called the *positive supporting reaction*, whereas the loosening of the limb is called the *negative supporting reaction*.

A. *The Positive Supporting Reaction.*

This reflex can be studied in the intact animal as well as after extirpation of the whole cerebrum or cerebellum. It is also present in certain stages of general narcosis. The following description is based especially upon the findings in the fore-limbs of cats. The results on the hind-limbs will only be mentioned if necessary. The effective stimulus for this reflex is stretching of the flexor muscles of fingers and hand. The deep flexor muscle of the fingers alone is sufficient to evoke the reflex. But also other flexor muscles can serve this purpose. The extero-

ceptive stimuli from the pads of the toes coöperate to the same effect.

1. The *anatomical arrangement* plays only a rôle of secondary importance for the establishment of the supporting reaction. Formerly there was a general belief in the importance of the ligaments for the fixation of the joints, but at present there is a tendency to believe that the tonic activity of muscles is the most important factor.

That the arrangement of ligaments cannot explain the supporting reflex follows from the fact that in cats and dogs during ordinary standing all three main joints of the hind-limbs are semiflexed, and can be moved from the resting position in both directions. Also in man in easy standing the ligaments of the leg are only of secondary importance. The muscles have the function of supporting each part of the limb and the body as a whole. For that purpose they are brought into tonic contraction by impulses from the central nervous system. The supporting reaction is reflex. This is already proved by the fact that simple pressure against the pads of the foot is sometimes sufficient to evoke the reflex by exteroceptive stimulation. The following observations point in the same direction.

In the first hours after extirpation of the fore-brain the supporting reaction is absent in spite of the presence of sufficient muscle tone. The post-operative shock has suppressed the reflex in an animal, which can right itself and even walk. Several weeks or months after severing the posterior roots to a fore- or hind-limb the movements are fairly well restored, and it is possible, by changing the position of the head, to increase the tone of the desensitised limb; in spite of this no trace of a supporting reaction can be felt. In deep narcosis it is impossible, by changing the position of its most distal part, to transform the limb into a supporting pillar.

All these facts show that the anatomical arrangement alone, even if the muscles have some tone, cannot explain the supporting reaction.

One arrangement deserves special attention: the two-joint muscles. A part of the flexors of hand and fingers stretched during standing takes its origin from the medial epicondyle of the humerus, and can extend the elbow. In doing this the biceps is stretched and, if this muscle comes into tonic contraction, it can extend the shoulder, which in turn stretches the caput longum of the triceps, so that contraction of this muscle can extend the elbow. Simultaneous contraction of biceps and triceps fixes not only the elbow, but also the shoulder. In the completely relaxed limb under deep narcosis or immediately after death this mechanism does not act, only extension of the elbow can be evoked by extension of the shoulder; but in the normal animal or when, after death, the muscles become rigid from rigor mortis, the two-joint muscles exert their influence. For this effect therefore reflex tension of the muscles is a necessary condition.

From the foregoing remarks it follows that the anatomical arrangement by itself cannot explain the supporting reaction, but constitutes the mechanism through which the physiological processes can play their rôle.

2. Of great importance are the *myotatic reflexes* of Liddell and Sherrington. These authors found in decerebrate preparations tonic reflex contractions caused especially in the extensor muscles by even slight stretch of the muscle. The increase of tension is confined to the muscle, which is stretched, and even one part of a muscle can show this purely proprioceptive reflex, if this part only is subjected to stretch. According to Forbes, Cobb, Fulton and Liddell, contraction may be confined to only a part of all the fibres of a muscle, just sufficient in number to counterbalance the stretch, or to carry the weight which causes the increase of tension. If these muscle-fibres become fatigued, other fibres go into contraction, and alternation of the active fibres makes it possible for the muscle as a whole to be indefatigable during myotatic activity. The reflex begins with a stretch and an increase of tension, and continues as maintained tension at a constant, increased length. The weight being thus just counterbalanced by the particular muscle-fibres in action at the moment, the others are prepared to move the limb or body, just as smoothly as if no weight at all was present.

This myotatic reflex comes into play in the flexor muscles of hand and fingers, which are stretched during standing by the dorsiflexion of these parts of the limb, and therefore react by increase of tension. In other muscles of the limb also, especially in the extensors of elbow and shoulder, if they become stretched during static activity, myotatic reflexes may coöperate with the direct supporting reflexes.

But besides these myotatic reactions many other reflexes coöperate in the supporting function.

3. According to Liddell and Sherrington, the myotatic reflexes in the decerebrate preparation are limited to the stretched muscles, or parts of muscles. This is not the case with the supporting reaction in normal or thalamus animals. If in experiments with graphic registration one or other flexor tendon to the hand or to one or more fingers is severed from its insertion and connected with a recording lever, it is seen to contract, although not stretched, when the hand and toes are dorsiflexed. In the course of the experiments the contraction of all the different flexor muscles during the static reflex has been in turn recorded. These facts show that the extension of the flexor muscles during standing sets up reflexes, which tend to bring into play the whole group of flexor muscles on the fore-arm, and that we have to deal with synergistic reinforcement of tonic contraction.

4. How do the *extensor muscles* react in the positive supporting reaction? They are not stretched at all. In a long series of marvellous investigations it has been shown by Sherrington that in ordinary *movements* antagonistic muscles obey the law of reciprocal innervation. Also in the experiments of Schoen reflex flexion of the hand was accomplished by contraction of the flexors and simultaneous relaxation of the extensors; and reflex extension of the hand (e.g., in the crossed extension reflex) by contraction of the extensors with relaxation of the flexors. But as soon as the supporting reflex was evoked by pressure against the pads of the sole and by dorsiflexion of hand and fingers, then there was a simultaneous contraction of both flexors and extensors. The functional grouping of the antagonistic muscles differs totally in the supporting reflex from that in ordinary movements: the antagonistic muscles exert a synergistic function and the result is *fixation of the joint.*

5. The elbow also becomes fixed.

(*a*) The fixation against flexion is accomplished by mechanisms differing according to the various possible positions of the fore-limb. In the first place, as mentioned above, the flexors of fingers and hand, especially the flexor digitorum profundus, take their origin from the epicondylus medialis humeri, and will therefore, if stretched during standing, cause fixation of the elbow directly by myotatic reflexes. In the second place dorsiflexion of hand and fingers gives rise to reflex contraction of the triceps. In the third place, stretch of the triceps evokes a myotatic reflex upon this muscle, and finally, if in the supporting reflex the biceps is stretched (by flexion of the shoulder) this also gives rise to a reflex contraction of the triceps.

(*b*) The fixation against extension is secured by a reflex contraction of the biceps caused by the dorsiflexion of hand and fingers, reinforced by a reflex, taking its origin in the stretched triceps.

All these different reflexes coöperate, reinforce, and, if necessary, replace each other, so that standing under very different positions of the joints becomes possible.

6. The fixation of the elbow, as far as the biceps and the long head of the triceps are concerned, depends

also upon the position and fixation of the shoulder-joint, as described above. The shoulder is fixed in the first place by these two double-joint muscles and in the second place by the shoulder musculature itself. For this joint also simultaneous contraction of flexors and extensors has been demonstrated. It may be mentioned that in the experiments of Schoen the supraspinatus muscle was very sensitive to the exteroceptive stimulus of touching the pads of the fingers.

7. The whole mechanism of fixation in the hand, elbow, and shoulder-joints would not be of any value for standing if there were not also a strong muscular fixation of the scapula to the thorax. The strong and broad mass of the levator scapulæ and the serratus, which are inserted on the scapula and take their origin from the neck region and the lateral parts of the thorax, form on both sides a bearing girth, by which the forepart of the body is slung between the two supporting pillars. The rhomboidei, connecting the vertebral column with both scapulæ, hold these bones in position and make the bearing function of the levator scapulæ and serratus effective. At the same time the pectoralis muscle and the latissimus dorsi fix the humerus to the trunk and secure the two pillars against abduction. If under certain conditions the levator scapulæ and serratus should give way, the pectoralis and latissimus on both sides can form a second bearing girth, which can also carry the thorax.

If the thalamus animal is hanging prone in the air, these shoulder muscles are usually tonically contracted. Standing on the ground increases this tone by reflexes evoked by dorsiflexion of the toes and exteroceptive stimuli of the finger-pads.

This short review, which naturally must be very incomplete, is sufficient to show how complicated is the system of different reflexes, which makes it possible to stiffen one limb and to transform it into a supporting pillar.

B. *The Negative Supporting Reaction.*

Besides the disappearance of those conditions which evoke the positive supporting reaction, active processes take an important part in interrupting the positive reaction and inducing the negative phase. The active stimulus is not exteroceptive. The limb in the negative phase is usually removed from the ground. The volar flexion of fingers and hand in the fore-limbs or plantar flexion of the toes in the hind-limbs is the effective stimulus. The reflex disappears in the fore-limbs after cutting all tendons of the extensor muscles of hand and fingers. In the intact limb it is evoked by stretching these extensors. In consequence of this there is a reflex relaxation of the extensor muscles of the proximal joints, which has been demonstrated by Schoen in the case of triceps, serratus anterior, and levator scapulæ. At the same time the flexors of the shoulder contract. The relaxation of serratus and levator scapulæ can be seen also to follow flexion of the elbow or even of the shoulder.

In this way the whole limb, especially the shoulder, is loosened and becomes free for movements.

The foregoing description shows the importance of local static reactions.

SEGMENTAL STATIC REACTIONS.

It will be sufficient to illustrate the segmental static reactions by some examples only. A very simple instance is given by the crossed extension reflex. In the standing animal the weight of the hind part of the body is carried by both hind-limbs and the weight of the fore part of the body by both fore-limbs. A painful stimulus applied to one limb evokes the ipsi-lateral flexion reflex, by which the stimulated foot is removed from the neighbourhood of the stimulus. The crossed limb, therefore, has to carry the weight of the fore or hind part of the body alone. This is made possible by the increased supporting reactions as described above, but is aided by the crossed extension reflex, which causes increased tone in the extensor muscles of the limb.

Another instance of segmental static reactions is afforded by the so-called "Schunkelreflex," which can easily be demonstrated in the fore- or hind-limbs of normal animals as well as after extirpation of the cerebellum or the fore-brain. Suppose that the animal (dog or cat) is standing on the table and one—e.g., the right—fore-limb is lifted up by the negative supporting reaction. The extensor tone of this limb is continuously tested by slight passive flexions of the elbow. The hand of the observer moves the thorax of the animal towards the right; then one feels an increased extensor tone of the elbow, and finally the limb is completely extended and able to prevent the fore part of the body from falling towards that side. The same reflex can be demonstrated in the hind-limbs and is also present in man, especially when we are standing on one foot and move towards the other side. Then the extension of the crossed knee is inevitable, and gives the subjective impression of being at least partly voluntary. But in animals the reflex is very active after complete extirpation of the cortex cerebri.

The reflex is not evoked by changes in the position of the head, neck, and vertebral column. The stimuli arise in the main from the adductor muscles, which are stretched by moving the body in the lateral direction. The reacting limb can be completely desensitised by cutting all the posterior roots carrying impulses from this limb; desensitisation of the standing limb, on the other hand, abolishes the reflex.

A similar reflex is present if the body be moved forwards or backwards. After lifting up one fore-limb the forward movement of the thorax causes the limb, which has been lifted up, to be extended and moved forwards, so that it prevents the body from falling.

The static "meaning" of this latter reaction is evident, but besides that the reaction also comes into play during walking and running. This shows that the same reflex can be used for the maintenance of equilibrium and for the purpose of walking.

These and other segmental static reactions, in which stimulus and effect are not confined to the same limb but to the same segment, show the interconnexion of separate parts of the body in static functions.

GENERAL STATIC REACTIONS.

In general static reactions more than one segment of the body, even the whole body, is concerned. Many examples will be given in the course of these lectures. A fundamental condition for every static reaction is that the animal shall stand or at least be able to stand. In the preceding section this was supposed to be the case. At the present moment we have to answer the question: Which parts of the central nervous system must be present for standing?

The classical experiments of Goltz and Sherrington have demonstrated that a *spinal animal* can perform very complicated movements. If in a dog the spinal cord be divided in the thoracic region, after some months a great number of reflexes can be evoked in the limbs: ipsi-lateral flexion and extension reflexes, a crossed extension reflex, rhythmic movements resembling walking and running or galloping, the scratch reflex, movements of hind-limbs and tail exactly similar to those which normal animals perform during defæcation and micturition. Under certain conditions even a flexor tone of long duration may be present in such a limb—e.g., when an ulcer on the foot develops; but in spite of all these very complicated and adapted innervations, no static tone is present, and the limbs cannot carry the weight of the hind part of the body: they give way after a very short time. The same is true for a spinal animal in which the cervical cord has been cut. All four limbs are under these conditions deprived of static tone.

In the "decerebrate" preparation the state of affairs is quite different. In these animals the brain-stem has been cut across somewhere between the plane of entrance of the eighth nerves and the foremost part of the mid-brain. It has been shown by Sherrington

that after decerebration the "decerebrate rigidity" develops, which is characterised by a strong tonic contraction of the "antigravity" muscles—viz., the extensors of the limbs and back, the elevators of neck and tail, and the closing muscles of the jaw. The antagonists of these static muscles, the flexors, have either a very slight tone or even none at all. If placed on its feet the decerebrate preparation will stand, that is to say, the strongly extended limbs will carry the weight of the body, but owing to the isolated and exaggerated contraction of the extensors the posture of the animal becomes abnormal and is deprived of the smoothness which is seen in intact animals. Sherrington has shown that "decerebrate rigidity" is a reflex phenomenon. The chief stimuli arise in the proprioceptive sense organs of the contracted muscles themselves. Later experiments have shown that, besides this, other sensory stimuli coöperate, arising from the crossed limbs, from the neck region, the labyrinths, the fifth nerves, the skin, &c. After cutting the cervical posterior roots and extirpating the labyrinths the neck muscles can still develop pronounced decerebrate rigidity. It is possible to provide the completely deafferented limbs of a decerebrate animal with a fair amount of tone by stimuli from other parts of the body. Experiments of Bazett and Penfield have shown that after decerebration the rigidity may last for weeks.

The reflex behaviour of the decerebrate animal differs from that of the spinal animal in a characteristic way. Under both conditions the flexor muscles perform reflex contractions of short duration after stimulation of an appropriate afferent nerve. The extensor muscles of the spinal animal also respond by short contractions. In the decerebrate preparation the reflex response of the extensor muscles is prolonged, and shows sometimes very long after effects.

The peculiarities of the decerebrate state will become still more evident when we later describe the different behaviour of animals with intact mid-brain.

A. General Static Reactions of the Decerebrate Preparation.

The essential condition for these experiments is that the hind part of the bulb has been left in functional connexion with the spinal cord. The presence or absence of the cerebellum is not essential; the presence of the oral part of the bulb, the pons, and the caudal part of the mid-brain causes the preparation to show a greater variety of reflexes, but does not contribute to the fundamental phenomenon in question.

General static reactions in the decerebrate animal can most easily be induced by changing the position of the head. This was discovered by chance. Many years ago I prepared a decerebrate cat with cross section of the low thoracic cord, in order to study some reflex reactions of the tail muscles. For this purpose I brought the animal from the lateral into the supine position and noticed to my surprise a slow but very strong "pathetic" extension of the fore-limbs, which disappeared when the animal was again placed upon its side. Other changes of position evoked also tonic reactions of the fore-limbs. Subsequent repetitions of the same experiment showed that various animals reacted differently. A long experimental analysis, in which I was joined by my friend and collaborator, De Kleyn, was necessary until we understood the phenomenon completely. As usual the result was comparatively simple. It is possible, by giving to the head different positions, to change the distribution of tone in the whole body musculature, and, as far as decerebrate preparations are concerned, especially in the above-named group of antigravity muscles. The most striking reactions appear in the extensors of the limbs and in the neck muscles. The effects observed are the result of combined reflexes from the labyrinths and from proprioceptive neck-receptors, and as the relative strength of these two influences varies from animal to animal, the different results of subsequent experiments can be understood. In this way it is possible to impress upon the whole body different adapted attitudes by changing only the position of the head. These reflexes therefore may be called *attitudinal reflexes*.

Every change of the head implies two different factors: (1) a change in the position of the head in relation to the body by which the neck-receptors are stimulated; and (2) a change of orientation of the head in space, which brings the labyrinths into play.

These facts allow us to study the two sets of reflexes separately.

1. *Tonic Neck Reflexes.*

In order to study the tonic neck reflexes upon the limb muscles without interference with the labyrinth reflexes it is necessary to extirpate the vestibular organs. This has been done by a method devised by De Kleyn without any lesion of the muscles on the basis cranii. After this operation the influence exerted by changes of the position of the head become independent of the orientation of the head in space. Only changes in its relation to the body cause tonic reflexes and these reflexes are now unequivocal, all animals reacting in the same sense.

Rotation of the head causes extension of the fore- and hind-limbs, towards which the jaw is rotated ("jaw-limbs"), and relaxation of the limbs, towards which the vertex is rotated ("skull-limbs"). Inclination of the head towards one shoulder causes extension of the fore- and the hind-limbs towards which the nose is inclined ("jaw-limbs") and relaxation of the limbs on the other side ("skull-limbs"). The general rule for rotation and inclination therefore is that the jaw-limbs are extended and the skull-limbs flexed. Dorsiflexion of the head causes, in all mammals except the rabbit, extension of the fore-limbs and relaxation of the hind-limbs. Ventroflexion of the head causes flexion of the fore-limbs and extension of the hind-limbs. In rabbits dorsiflexion of the head causes extension of all four limbs, and ventroflexion of the head causes flexion of all limbs. In all mammals with the exception of the rabbit, movement of the head in different directions is followed by opposite reaction of one pair of limbs as compared with the other. Relaxation of the four limbs in all mammals is given only by pressure upon the lower part of the cervical vertebral column in a ventral direction (vertebra prominens reflex).

The afferents for these reflexes (with the only exception of the vertebra prominens reflex) take their course through the three uppermost cervical posterior roots. The centres of the tonic neck reflexes have been localised in the first and second cervical segments.

2. *Tonic Labyrinthine Reflexes.*

These reflexes can be studied separately after excluding the neck reflexes. This can be done either by cutting on both sides the three first cervical posterior roots or by immobilising head, neck, and thorax by a strong plaster-jacket, so that no movements of the head in relation to the body are possible, while the fore-limbs are left unrestrained and can be moved freely. If such a preparation be brought into different positions in relation to space the extensor tone of all four limbs always changes in the same sense. There is only one position in which the extension becomes maximal: the supine position with snout about 45° above the horizontal plane. The extensor tone diminishes to a relative minimum if the animal is brought into the prone position with snout about 45° below the horizontal plane. The minimum and maximum positions differ, therefore, by 180°. In all other positions in space the extensor tone is intermediate between these two extremes. These reflexes are not evoked by movement but depend upon position. They are independent of angular acceleration and last as long as a certain position is kept. Only such changes in the position of the head are effective as change in its angle in relation to the horizontal plane.

The labyrinthine origin of these reflexes is proved by the fact that they disappear after bilateral labyrinth extirpation. A delabyrinthised decerebrate cat

in which the neck has been immobilised by a plaster bandage, can be brought in all possible positions in space without any changes in the tone of the limb muscles.

The tonic labyrinthine reflexes arise from the otolithic organs. In mammals it is not possible to prove this by isolated extirpation of the otolithic maculæ or of the ampullæ of the semicircular canals, for this cannot be done without opening the peri- or endo-lymphatic space, and therefore definitely disturbing the vestibular function. Another method was, therefore, used. Following a technique first devised by Wittmaack, guinea-pigs under ether were centrifuged for a short time at high speed. Then the otolithic membranes are detached by the action of centrifugal force, whereas the canals with ampullæ and cristæ remain intact. In each case a microscopic investigation must be made, and this must show that the ampullar nerve-endings and the canals are intact, that all four otolithic maculæ are completely deprived of their otolithic membranes, and that these four membranes can be found, remote from them, inside the endolymphatic space. This last point is of importance, because it proves that the detachment of the membranes occurred intra vitam and not as a result of faulty fixation or cutting of the section for examination. Only from experiments with complete histological evidence may definite conclusions be drawn.

In such animals all labyrinthine reactions evoked by angular or rectilinear acceleration are present, but all reflexes resulting from position have disappeared, including the tonic labyrinth reflexes upon the limb muscles. These reflexes, therefore, depend upon the otoliths.

The position of the otoliths in relation to the skull has been carefully investigated by De Burlet and his pupils in the anatomical department of the University of Utrecht. The results of their measurements have been used for the construction of models (guinea-pigs, rabbit, monkey, man).

The two maculæ utriculi are situated approximately in the same plane, which is nearly horizontal, when the animal carries its head in the normal position. The two maculæ sacculi are not at all in the same plane; they form as far as their chief portion is concerned an angle of rather less than 90° with the utricular maculæ. With normal position of the head the two maculæ sacculi face towards the lateral side.

If the head of a rabbit is brought into the maximum position for the tonic labyrinthine reflexes the saccular maculæ have no characteristic position, whereas the utricular maculæ are lying in a horizontal plane. In the maximum position, in which the extensor tone of all four limbs has reached its highest value, the otolithic membranes exert a pull on the macular epithelium. In the minimum position for the extensor tone, the maculæ stand again horizontal with the otolithic membranes pressing upon the epithelium. The conclusion is that the *tonic* labyrinthine reflexes are evoked from the utricular maculæ. This is confirmed by the fact that after unilateral labyrinth extirpation the maximum and minimum positions for the tonic labyrinth reflexes remain unchanged, which would be impossible if the maculæ concerned in these reflexes did not lie in the same plane.

In the position in which the extensor tone of the limbs is maximal, the otoliths pull on the utricular maculæ. The conclusion that the maximum of stimulation in the macular epithelium is induced, not by the pressing, but by the pulling otolith, is proved to be sound by observations on saccular reflexes, a part of which will be mentioned later.

The centres for the tonic labyrinthine reflexes upon the limb muscles have their position in the hind part of the bulb, behind the plane of entrance of the eighth nerves.

Besides the tonic utricular reflexes on the limb muscles there are also tonic utricular reflexes on the neck muscles, which follow in general the same laws. The only difference is that every utricular macula sends impulses to the limbs of both sides and to the neck muscles of the crossed side only. As a consequence of this unilateral labyrinth extirpation is followed by no change in the tonic labyrinthine reflexes upon the limbs, but evokes the well-known turning of the neck, which has been described by all previous observers. This rotation and inclination of the head causes secondary tonic reflexes upon the limb muscles. The connexion of the labyrinths with the limbs is, therefore, a double one: (1) by tonic labyrinthine reflexes directly upon the limbs, and (2) by tonic neck reflexes upon the limbs indirectly through labyrinthine influences upon the neck.

3. *Combinations of Tonic Labyrinthine and Neck Reflexes.*

If both sets of reflexes are present, they coöperate so that the tone of every single muscle depends upon the algebraic sum of influences derived from proprioceptive end-organs in the neck and from the utricular maculæ. If, therefore, the triceps muscle of the right elbow derives increased tone from the labyrinths and from the neck, the elbow will be strongly extended; if this muscle gets diminution of its tone from both sources the elbow will relax, but if the muscle tone is increased from the labyrinths and decreased from the neck the result depends upon the relative strength of these influences. If the labyrinthine reflexes predominate the elbow will be extended, if the neck reflexes are stronger it will be flexed, and if both reflexes are of the same strength the angle of the elbow will not change at all.

This coöperation gives rise to very characteristic attitudinal reactions of decerebrate animals. Place a cat in the prone position upon the table and flex the head ventrally, then the labyrinths come into the minimum position and all four limbs will tend to relax. The neck influences cause relaxation of the fore-limbs and extension of the hind-limbs. Both groups of reflexes, therefore, coöperate in the fore-limbs, which show distinct relaxation, whereas the hind-limbs may not change at all, because the influences from neck and labyrinths act in opposite senses. If with the prone position of the animal the head is bent dorsally the resulting removal of the labyrinths from the minimal position causes extension of all four limbs. The neck reflexes evoke extension of the fore-limbs and relaxation of the hind-limbs. The combined effect is strong extension of the fore-limbs and only slight changes in the hind-limbs. Head movements, therefore, in a ventral and dorsal direction have a very strong influence on the fore-limbs, whereas the reaction of the hind-limbs is much weaker.

Still more complicated is the effect of head rotation with the lateral position of the animal. In this case I shall describe only the effect upon the fore-limbs. If with the right lateral position of the animal the head is rotated so that the vertex is below, then the labyrinths are in maximum position, which gives rise to strong extension of both fore-limbs. In respect of the neck reflexes the uppermost fore-limb is "jaw-limb" and will be extended, whereas the lowermost fore-limb is "skull-limb" and will be flexed. Both influences coöperate for the uppermost fore-limb, which is strongly extended. The behaviour of the lowermost fore-limb is different according as one or the other reflex preponderates. With stronger labyrinthine reflexes it is extended. With stronger neck reflexes it relaxes. When the strengths of both groups of reflexes are equal, it remains unchanged. The reaction of the lowermost fore-limbs to rotation of the head with the lateral position of the animal affords, therefore, the possibility of determining in a given animal the relative strength of both sets of reflexes. If, now, with the same lateral position of the body the head be rotated with the vertex uppermost, then the labyrinths come into the minimum position and both fore-limbs will tend to relax. In the upper fore-limb this relaxation is reinforced by

the neck influence (skull-limb). In the lower fore-limb it is counterbalanced by the neck influence (jaw-limb). With preponderant labyrinthine influences the lower fore-limb is relaxed; with preponderant neck reflexes it is extended. In every case with the right lateral position rotation of the head evokes very strong and unequivocal reactions of the left (upper) fore-limb, whereas the reactions of the right fore-limb are weaker and of indefinite direction. Now, the animal is placed in the left lateral position and again the head is rotated. The same rules can now be applied with this difference only, that the upper fore-limb is now the right one. In this case the right fore-limb will react strongly and the left fore-limb may not move at all. It becomes evident that one and the same rotation of the head causes with the right lateral position of the animal strong relaxation of the left fore-limb, and with the left lateral position strong extension of the right fore-limb. This instance shows clearly that the same movement of the head in relation to the body may, with different spatial positions of the body, evoke very different reactions But in spite of these complications, which were very amazing at the time when the experiments were started, it has been possible to explain all reactions, observed in more than a hundred experiments, in which the head was moved about the three chief axes with each of the six main positions of the body in space by the combined action of utricular and neck reflexes.

The attitudinal reflexes are called tonic, because they last as long as the head keeps a certain position. They are practically indefatigable. After unilateral labyrinth extirpation in rabbits the turning of the neck lasts until the animal dies. Also the tonic neck reflexes upon the limbs evoked by this head rotation can be demonstrated as long as the animal is alive. On the other hand, every change in position of the head is followed immediately by the corresponding change in the attitude of the whole body. The influence of the tonic attitudinal reflexes is very strong upon the muscles of the proximal joints, shoulder and hip, elbow and knee; on the distal joints of hand, foot, toes, and fingers the action of these reflexes is much less pronounced.

The mechanism as a whole acts in such a way that the head leads and the body follows. The attitudes impressed upon the body by a certain head position in the decerebrate preparation closely resemble the natural attitudes shown by the intact animal during ordinary life.

4. *Attitudinal Reactions in Intact Animals and in Man.*

This leads to the question of the presence of attitudinal reflexes in normal animals with intact central nervous system. In most mammals they are present and can easily be demonstrated. In the normal rabbit dorsiflexion of the head in the sitting animal causes tonic extension of the fore-limbs; head rotation with the rabbit in the supine position evokes extension of the jaw-limbs and relaxation of the skull-limbs.

It is not necessary that the head movements shall be passive. The same laws hold good when the animal performs active head movements. As these depend very often upon stimuli transferred to the animal by way of the distance receptors (eye, ear, nose), it is possible to impress upon the body of the animal different attitudes from distant points of the environment. A cat which sees some food lying on the ground flexes the head in the ventral direction, and this causes the fore-limbs to relax so that the snout is moved towards the food; but if a piece of meat be held high up in the air the optic stimulus causes dorsiflexion of the head. This evokes strong extension of the fore-limbs without marked extension of the hind-limbs. The body of the animal is not only focused on the meat, but is also brought into a position which is optimum for the springing reflex, so that by a strong sudden simultaneous extension of the hind-limbs the animal can reach the meat.

The activity of the vertebra prominens reflex can be watched in a cat or dog creeping into a hole. In doing so, the animal brings its head close down to the ground with resulting relaxation of all four limbs, so that the belly lies flat upon the floor.

Many other instances of the action of attitudinal reflexes in intact animals have been observed. A striking difference between the reaction of the decerebrate and the normal animal is that in the decerebrate preparation the flexor muscles, which have no tone, do not take part in the reaction or respond only very slightly. In the intact animal the flexor muscles also, as will be shown later, have tone, and react to the tonic neck and labyrinthine reflexes. In this they follow the law of reciprocal innervation. Increase of extensor tone is associated with diminished flexor tone and vice versa. In this way the attitudinal reflexes of intact animals are much smoother than the stiff and always exaggerated attitudes of the decerebrate preparation.

In monkeys during their ordinary movements it is not easy to detect the presence of attitudinal reflexes, which, on the other hand, can with certainty be demonstrated in the decerebrate or narcotised animals.

In man also the presence of attitudinal reflexes in ordinary life is not striking. Good pictures and statues give the impression of being natural, if the body is represented according to the laws of attitudinal reflexes. If these laws are not obeyed we get the impression of a dead body or of a caricature. But the complexity of human movements during ordinary life usually obscures the simple attitudinal reactions. In a certain percentage of babies, however, the influence of head rotation upon arms and legs can be seen.

Under pathological conditions the presence of attitudinal reactions in man may become evident, especially when disease has interfered with the function of the higher parts of the brain. Very diverse pathological conditions give rise to the appearance of these reflexes, which are now used by neurologists for diagnostic purposes; head rotation especially causes extension of the jaw-limbs, sometimes accompanied by relaxation of the skull-limbs. In this case neck reflexes are present. In a minority of cases also tonic labyrinthine reflexes have been demonstrated, in which all four limbs reacted in the same sense, and in which, precisely as in animals, a maximum and a minimum position of the head could be determined. If both sets of reflexes are present their coöperation follows the same laws as in animals. It has been shown by Simons and by Walshe that the direction of associated movements of paralysed limbs, evoked by active voluntary movements of non-paralysed parts of the body, can be influenced by the position of the head.

The attitudinal reflexes form a group of tonic reactions, by which the whole body musculature is integrated for a combined and highly adapted function. The entire body follows the direction assumed by the head, this being very often moved in a certain direction under the influence of the telereceptive higher sense-organs. This provides one of the ways in which the relation of the body to its environment is regulated. It need only briefly be mentioned that the different attitudes, with their different distribution of tone and tension in the numerous muscles of the body, are associated with different distributions of reflex irritability over the central nervous system. Therefore one and the same stimulus may cause quite different reflex reactions according to the different attitudes of the animal at the moment the stimulus is applied.

These short remarks may be sufficient to show to what extent the reflex behaviour of animals may be influenced by attitudinal reflexes. The complexity becomes still greater if besides the bulbar centres with their relatively simple function higher centres come into play. This will be discussed in the next section.

(To be concluded.)

NEW GROWTHS IN THE THORAX.

DIFFERENTIAL DIAGNOSIS FROM TUBERCULOSIS.

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THE six cases on which this paper is based have come under my own personal observation, and are used to illustrate the evidence which, in my opinion, should be taken into account in making a differential diagnosis between intrathoracic new growths and pulmonary tuberculosis.

Clinical Histories.

CASE 1.—A man, aged 52, was admitted in October, 1922, with a diagnosis of "serious tubercular disease of the left lower lobe and a lesion at the right apex." His illness dated from October, 1921, when he had "influenza," followed by persistent cough. In March, 1922, he had dry pleurisy at the left base, after which he began to lose weight rapidly, and had fever, with troublesome cough, pain in the left chest, and increasing weakness and dyspnœa. A physician who saw him diagnosed pulmonary tuberculosis, but considered tumour possible. There were signs of slight infiltration at both apices, without adventitious sounds, and evidence of fluid at the left base. X rays showed fluid at the left base, and above the fluid a clear space bounded by a domed shadow. The fluid was level and moved on inclining the patient, showing that there was air in the pleura, probably due to puncture of the lung by an exploring needle before admission. Both apices were slightly infiltrated, and the heart was displaced to the right. Some blood-stained fluid was withdrawn and was sterile on culture, and no tubercle bacilli were found either in this or in the sputum. The fluid was aspirated, and the X rays then showed a dense shadow involving most of the lower lobe, which the radiologist and I regarded as highly suggestive of tumour. The W.R. and the complement-fixation test for tuberculosis were negative. There was a leucocytosis of 29,000, 86 per cent. being polymorphs. He had a few small hard glands above the right clavicle and one of these was dissected out and reported to be histologically tuberculous, but no T.B. were seen. He had vague digestive symptoms with slight epigastric tenderness. Later he vomited some "coffee grounds," and with further rapid loss of weight a small tumour became palpable in the epigastrium. This made a diagnosis of primary carcinoma of the stomach, with secondary deposit in the lung, practically certain, and he was sent home. He died in February, 1923—i.e., 18 months after the onset of his illness. There was no post-mortem examination.

CASE 2.—A female, aged 42, two children, two miscarriages. Admitted April, 1923, from another sanatorium, where the diagnosis was "tubercular cervical adenitis and tuberculosis of the left lung."

History.—February, 1922, dry cough appeared, followed soon after by post-sternal pain and lassitude. June, 1922, pulmonary tuberculosis was diagnosed, and she was sent to a sanatorium in September, 1922, and remained there till April, 1923. There was mild persistent fever all the time and cough and pain did not improve. Once or twice the sputum was blood-flecked, but T.B. were never found, though the Pirquet reaction was positive. Glands were noticed in the neck, and she was treated with tuberculin inunctions for six months. Previous illnesses: Aged 18, enlarged glands in neck for some months. Aged 19, probable pleurisy at right base. Family history: Mother died of fibroid phthisis, aged 73.

Condition on Admission.—Dyspnœa on mild exertion; fingers somewhat clubbed. Complained of almost constant aching pain in the left chest, and there were mild fever and tachycardia. There was a bunch of firm movable glands above the left clavicle, and a string of small glands along the posterior border of the sterno-mastoid; also enlarged glands in the left axilla. The veins on the left side of the chest were prominent. The left chest was flattened and expanded poorly, and vocal fremitus and resonance were decreased. The percussion note was dull except in the axilla; the breath sounds were faint, and a few muffled râles were heard at the apex. On the right side there was some intrascapular dullness on percussion and a few crepitations in the second interspace in front. The heart was a little displaced to the right; there were no bruits. By X rays the screen showed some displacement of the heart to the right, and the left diaphragm high and nearly immobile. At the root of the right lung there was a small clearly outlined dark shadow, and on the left side a larger dark shadow with a clearly outlined natiform border—evidently enlarged glands. This shadow was continuous with the mediastinal shadow and was non-pulsatile. The film showed the condition very well. I obtained a print of a radiogram taken nine months previously and the change was very striking. The sputum was scanty; no T.B. found. There was a leucocytosis of 20,000, of which 88 per cent. were polymorphs. The W.R. was negative, but the complement-fixation test for tuberculosis was positive (possibly due to the tuberculin inunctions). A provisional diagnosis of Hodgkin's disease was made, and a gland was dissected out and reported by a pathologist as "typical lymphadenoma." She was obviously getting worse, and was sent home to have X ray treatment. Temporary improvement resulted, but she died in September, 1924—i.e., about two and a half years after the onset of symptoms.

CASE 3.—A male, aged 40, a medical man. Admitted January, 1924, with a diagnosis of "acute pulmonary tuberculosis."

History.—October, 1923, sudden pain over right lower ribs with fever and some cough. A doctor found doubtful friction at the right base. Two weeks off work and then felt as usual. November, 1923, a second attack of fever with cough, and there were signs of a pleural effusion at the right base. One c.cm. of blood-stained fluid was drawn off and was found to be sterile, though containing many polymorphs. A blood count gave 30,000 leucocytes, 70 per cent. being polymorphs. Fever persisted and dyspnœa and cough increased when he lay on his right side. X ray examination, "mediastinal mischief growing into the lung"; and as two T.B. were seen in the sputum at the seventh examination, a diagnosis of pulmonary tuberculosis was made. Previous illnesses: Pneumonia at 17, dysentery at 30, acute dyspepsia at 31, and at 34 severe indigestion, for which he was invalided home from India as duodenal ulcer. After a year's treatment he was practically well.

Condition on Admission.—Poorly nourished, with pallor, cyanosis of the lips, and dyspnœa on slight exertion. He complained of constant aching pain in the right chest, and there was troublesome dry cough with glairy sputum. There were signs of some infiltration of the right upper lobe with a few crepitations and rhonchi behind. At the right base were signs of a small fluid effusion. Nothing abnormal was made out in the left lung. X ray examination showed moderate density at the right apex and a dense shadow above the diaphragm, suggestive of fluid, but also, above the level of the fluid, a dense non-pulsating shadow with an irregular but clear outline continuous with the mediastinal shadow. On the left side the apex was not quite clear and the root shadows were somewhat pronounced. The heart was apparently sound. The radial pulses were equal. There was a leucocytosis of 26,000, of which 80 per cent. were polymorphs. The sputum was examined repeatedly and eventually a few acid-fast bacilli were seen in a concentrated 24 hours specimen. Pneumococci were always numerous. A specimen was sent to Dr. J. Cruickshank, who reported that "after concentration a few T.B. were seen," but he inoculated a guinea-pig with some of the sputum and reported later that "the guinea-pig remained quite well, and that the acid-fast bacilli found by concentration were probably not tubercle bacilli."

I explored the right base and got some turbid fluid which contained many cells of which 90 per cent. were polymorphs. No T.B. were seen and no growth obtained on culture. A guinea-pig inoculated with some of the fluid did not develop tuberculosis. The W.R. was negative, as also was the complement-fixation test for tuberculosis. The patient improved at first, but six weeks after admission the sputum became constantly blood-stained and the cough ineffective. A mouse injected with some of the sputum died of pneumococcal infection, and an autogenous vaccine was prepared, but never given, as the symptoms became urgent somewhat suddenly. Dyspnœa increased greatly, and there were attacks of stridor with intense cyanosis and spasms of cough.

I asked Prof. Ashley Mackintosh to see him and he agreed that malignant disease was the most likely diagnosis, though there was probable antecedent tuberculous infection. His symptoms were not relieved to any extent by oxygen, adrenalin, or morphine, and he died in a few days. No post-mortem examination was permitted.

CASE 4.—Male, aged 52. Admitted August, 1924, with a diagnosis of "pulmonary tuberculosis of the right lower lobe."

History.—Healthy man till December, 1923, when he had dry pleurisy at the right base with fever and hæmoptysis. In bed one month and returned to work after another month. May, 1924, another attack of dry pleurisy at right base with slight fever and hæmoptysis. T.B. not found. July, 1924, had further hæmoptysis, lost weight, and dyspnœa became troublesome. Saw a consultant who diagnosed pulmonary tuberculosis.

Condition on Admission.—Pale and ill-looking. No special cyanosis, but he was dyspnœic on mild exertion and complained of constant aching pain of the right chest, shoulder,

and arm. Troublesome cough with considerable muco-purulent sputum. There was evening fever of 100° to 101° F. The voice was husky, but the larynx looked healthy. Examination of the chest suggested either fluid or much thickened pleura at the right base with infiltration of the upper part of the lung, and a few muffled râles were heard at the intrascapular region behind. The exploring needle failed to find fluid and was felt to pass into consolidated lung. The heart was not displaced, but there was dullness to the right of the sternum. The X rays on screening showed the right diaphragm to be invisible owing to a dense domed shadow with a sharp outline, extending from the lateral chest wall towards the mediastinum, where it merged into what appeared to be a non-pulsating mediastinal outgrowth. The film showed this very well and also showed some calcareous-looking patches about the root of the left lung. The W.R. was negative as was the complement-fixation test for tuberculosis. Repeated examinations of the sputum failed to demonstrate T.B. A guinea-pig was inoculated with negative results. The patient gained a little weight at first, but the fever did not improve and the sputum was often blood-stained. Dyspnœa and weakness were progressive. The physician who had seen him before admission agreed that the diagnosis was primary malignant disease of the lung or mediastinum.

The patient was sent home and died one year after the onset of his illness. His doctor wrote me that he became very breathless with severe spasms of cough. There was no post-mortem examination.

CASE 5.—Male, aged 55. Admitted September, 1924, from another sanatorium.

History.—April, 1923, a "chill" followed by shortness of breath. September, 1923, given a "clean bill of health" by a well-known physician. December, 1923, dry pleurisy at left base—three months in bed. Explored for fluid two or three times, but none found. April, 1924, began to get up, and in May went away for a change, but was compelled to return home by exhaustion and increasing dyspnœa, and was then sent to a sanatorium where exploration again failed to find fluid. Cough and fever got worse and he was transferred to Tor-na-Dee. Previous illnesses: Gonorrhœa twice 30 years ago. Several mild malarial attacks some years ago. Had spent 22 years in tropics, last six years in this country. Formerly a heavy smoker and drinker. Took no care of himself until he married, aged 50.

Condition on Admission.—Much emaciated with facial pallor, but cyanosed lips, ears, and nails. Dyspnœa on movement and cough, but no stertor. Sputum scanty, sticky, and sometimes blood-stained. Repeated tests, including concentration, failed to demonstrate T.B. There was irregular fever up to 103° F. and low blood pressure; the radial pulses were equal. The left chest was flat and almost immobile with very poor air entry and almost absolute dullness. A few muffled râles at the apex behind. Complemental emphysema of the right lung and the heart well over to the left; no bruits. X rays showed emphysema of the right lung with some infiltration at the apex, roof-tiling of the left ribs, and complete opacity of the left lung except at the apex. The heart and mediastinum much displaced to the left. W.R. and complement fixation for tubercle negative. Exploration of the chest obtained a little blood-stained pus. Dr. Cruickshank reported that this pus contained no T.B., but some Gram-negative bacilli, and on culture a streptothrix was grown which did not infect animals. He became weaker rapidly and died on Dec. 28th, 1924.

Though I felt pretty sure that the diagnosis was malignant disease, I obtained a post-mortem examination, which was conducted by Dr. Cruickshank. The left lung was totally adherent by greatly thickened pleura and was greatly shrunken. On section it was soft and riddled with small cavities and dilated bronchi full of pus. The right lung was emphysematous with an old scar at the apex. One of the ribs on the right side had a swelling bulging into the pleura, and this, on section, contained thin curdy material, and the rib was necrosed. On the liver was a small white flat nodule. Dr. Cruickshank and I agreed that the appearances were very like tuberculosis, but in view of the absence of T.B. from the sputum and the material aspirated from the lung, we decided to have sections cut. These proved undoubted epithelioma of the lung with metastases to the rib and liver.

CASE 6.—Male, aged 47. Admitted May 14th, 1925. The physician's letter stated that "he had had a large effusion on the left side, and an attempt to tap this had induced a pneumothorax. A week later there was again general dullness all over the left side, and a little blood-stained fluid was removed, which proved to be sterile. The case is complicated with a positive W.R., and he was having pretty drastic treatment for this when he became so ill that the treatment was discontinued."

History.—November, 1924, a bad "cold" followed by persistent cough and shortness of breath. December, 1924, blood-stained sputum for ten days with recurrence for two days when he got up. Worked from Jan. 8th to March 17th, 1925, when hæmoptysis recurred. His W.R. had been found positive in January, and 11 injections of salvarsan were given up to March 14th. There was considerable fever after the third hæmoptysis, and he was seen by a physician in April, and a diagnosis of tuberculosis made. Husky voice was first noticed in January. Previous illnesses: 1909, soft chancre—no general treatment. Family history: Father died of cancer; one sister of doubtful tuberculosis.

Condition on Admission.—He was very pale, but not thin. He complained of dyspnœa on mild exertion and a "restricted feeling" of the left chest. The cough had a brassy character and sputum was scanty. Repeated tests, including concentration, failed to demonstrate T.B. There was no fever, but moderate tachycardia. The radial pulses were equal as were the pupils. His voice was husky and the left side of the intrinsic larynx was seen to be paralysed. The left chest was flat with poor expansion and decreased vocal fremitus and resonance. The percussion note was flat over the whole lung area except in the axilla, and the breath sounds were absent at the base, and faint, but bronchial, at the apex. The right lung was emphysematous and the heart was displaced to the left. The X rays showed a dense shadow involving the whole of the left chest, with the heart lost in the shadow, but evidently displaced to the left. The right lung was clear. The white cell blood count was 10,800, of which 64 per cent. were polymorphs. The W.R. reaction was negative—two tests. The complement-fixation test for tuberculosis was also negative. The Pirquet reaction was moderately positive. The exploring needle got a little blood-stained fluid. Dr. Cruickshank reported that no organisms were seen in, or cultivated from, the fluid. A guinea-pig was inoculated and was reported later to show no signs of tuberculosis. In the clot which formed, and of which sections were cut, Dr. Cruickshank found an epithelial cell nest, which he regards as positive proof of epithelioma of the lung.

I had prescribed potassium iodide in full doses in view of the patient's history and he gained weight at first with rest and diet, but he began to have irregular fever, and dyspnœa increased, with cyanosis when recumbent, evidently due to interference with the venous return from the head and neck. Dr. A. Greig Anderson, who saw him with me, agreed that the diagnosis was malignant tumour, probably growing from the left mediastinum. He was sent home, and died on August 17th, 1925—i.e., nine months after the onset of his illness. His doctor reported that the last two days of his life were "a terrible struggle for breath." No post-mortem examination was sanctioned.

Discussion.

In some of these cases the appearance of the patient before any questions were asked raised a doubt. The peculiar pallor or cachexia associated with malignant disease, wherever situated, was noted in varying degree in all except the case of Hodgkin's disease. The age of the patient is a point to keep in mind especially when there is no history suggestive of tuberculous infection, such as pleurisy or fistula in ano, though former tuberculosis does not exclude present tumour. The history may arouse no suspicion, for the symptoms of new growth may be indistinguishable from those of pulmonary tuberculosis. The onset may be insidious or more sudden—for example, with the pain of pleurisy. Cough and sputum are usual, hæmoptysis is common, and dyspnœa is an early symptom in both diseases. Again lassitude, general weakness, loss of weight, fever, night sweats, alteration of the voice, and digestive disturbance are not distinctive. The character of the thoracic pain may give an indication—the pain of mediastinal tumour may resemble the dull boring pain of aneurysm, but the pain may be of pleural origin and so not characteristic. If the cough and dyspnœa be paroxysmal and if accompanied by vomiting without nausea, pressure on the vagus may be thought of. Stridulous cough or stertorous breathing may suggest pressure on the trachea or large bronchi. Similarly, dysphagia due to pressure on the œsophagus, or headache, giddiness, and drowsiness due to interference with the return of blood from the brain may arouse suspicion. I cannot say that, in any of my cases, the symptoms themselves caused me to question the diagnosis on admission, except perhaps in Case 2, where the pain was

post-sternal and constant, and in Case 6, where the cough was "brassy."

Cyanosis of the face and neck except with paroxysms of cough was not a feature of my cases. Inequality of the pupils and of the radial pulses were absent, nor was tachycardia or bradycardia specially notable. In one case laryngeal paralysis proved pressure on the left recurrent laryngeal nerve. Dilated veins on the chest were observed in two cases, but œdema of the chest wall did not occur. The enlarged glands in the neck and axilla in the case of Hodgkin's disease arrested attention. The pulmonary physical signs were, in three of my cases, in keeping with a diagnosis of pulmonary tuberculosis—i.e., apical infiltration with adventitious sounds and basal pleural effusion. In the lymphadenoma case and in the other two malignant cases the physical signs aroused suspicion because their localisation and character were unusual.

In malignant disease of the lung abnormal physical signs are commoner in the lower lobes, and in mediastinal growths the physical signs may be atypical of tuberculosis—e.g., intrascapular or parasternal dullness. I was much struck in Cases 5 and 6 with the intense dullness over most of the left lung as if the pleura were nearly full of fluid, and yet the chest wall was much flattened and the heart displaced to the same side. Faint breath sounds with few or no adventitious sounds, in the absence of pleural effusion, suggest an infiltration or collapse of the lung unlike a tuberculous process. The râles and rhonchi heard in malignant disease of the lung are due to the associated bronchitis, and may have a different character from those usually heard in tuberculosis.

X ray examination is, in my opinion, of great importance in distinguishing new growth in the thorax from tuberculosis. In the case of lymphadenoma the enlarged glands were beautifully shown. In Cases 1, 2, and 4 the domed shadow at the lower part of the lung continuous with mediastinal outgrowth definitely suggested something other than tuberculosis.

Examination of the sputum, I need hardly say, is highly important. Failure to find T.B. by the usual methods should always raise doubt, especially where there is evidence of gross intrapulmonary disease, and a guinea-pig should be inoculated. It is said that shreds of tumour or suspicious clusters of cells may sometimes be found in the sputum. "Red currant jelly" sputum is suggestive, and occurred in Case 3. It was in the same case that acid-fast bacilli were found by concentration, but later reported by Dr. Cruickshank to be probably not tubercle bacilli as a result of the guinea-pig test.

Examination of a pleural effusion may be helpful. Hæmorrhagic effusion is suggestive, but not diagnostic of malignant disease. T.B. may be microscopically absent in tuberculous effusions, but a guinea-pig test may prove their presence. Cells characteristic of malignant disease may be found as in my Case No. 6. It is perhaps a risky procedure, at all events where the pleura is free, to pass a large bore needle into the lung and withdraw a shred of lung tissue or its contents for examination. I can imagine a diagnosis of malignant disease being confirmed by this means, but in Case 5 in which I did this no help was obtained; indeed, the cultivation of a streptothrix caused some confusion. The removal of all the pleural effusion followed by X ray examination may aid diagnosis by showing the underlying condition more clearly as in Case 1. A negative W.R. is against a syphilitic lesion and less certainly a negative complement-fixation test against active tuberculosis. Similarly, a positive tuberculin test only means former tuberculous infection and does not exclude new growth. If any accessible lymphatic glands are enlarged the excision of one for pathological examination may decide the diagnosis as in my lymphadenoma case. On the other hand, it may confuse the issue, as in Case 1, where a gland from the neck was reported tuberculous. Lastly, where malignant disease is suspected, a careful search should be made for either a primary or secondary lesion in other organs. If found the diagnosis may be clinched as in Case 1, where there was primary disease of the stomach. A history of a former operation for malignant disease may be suggestive.

I have tried to touch upon the various means which I have utilised in trying to differentiate between intrathoracic new growth and tuberculosis, but I can easily imagine a case in which a definite diagnosis cannot be made during life, and, after my experience with Case 5, I can even imagine a wrong diagnosis being made on the post-mortem table, unless the morbid tissues be examined histologically.

CEREBRO-SPINAL FEVER IN BOMBAY.

A STUDY OF 170 CONSECUTIVE CASES DURING THE YEARS 1921–24.

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CEREBRO-SPINAL fever has been noticed in India for almost half a century; the first authentic report of a case is by Vandyke Carter, who records having seen four cases in Bombay when he was working at famine fever in 1878[1] and another sporadic case in 1885.[2] Lieut.-Colonel Dimmock[3] recognised the disease in epidemic form amongst the convicts of the Shikarpur Jail during the cold season of 1883–84.

Since 1881 cases have been reported all over India from various jails, army barracks, &c., but in Bombay proper cases began to arrive in municipal hospitals in the year 1912. They were diagnosed as cerebro-spinal fever from clinical signs only till 1921, when the present observations began.

Ætiology.

This is essentially a disease of winter and spring and most of the admissions here were during these seasons. Sudden marked variation in the temperature appear to exert an important influence in predisposing to the disease, as did also overcrowding, exposure, and starvation. In most epidemics the greatest number of cases have occurred in children under 15, but a few epidemics in adults have also been recorded, as in the recent world war. In this series most of the cases were adults over 20 years of age. Although in other epidemics the proportion of males show some preponderance over females, here males entirely preponderate.

Almost all castes are affected, but those admitted here were mostly Bhaiyas, Pathans, &c., who are generally exposed to the rigours of the weather in their work, and the majority of whom belong to the working classes. The most common feature in the epidemic was the manner in which cases occurred in different districts, and the spread from one person to another seemed unusual. There was one case of convalescent influenzal pneumonia in the Maratha Hospital who contracted the disease from another case of cerebro-spinal fever, who was at the other end of the ward, and there are cases recorded in the members of one family and also in nurses and attendants on patients suffering from cerebro-spinal fever; the infection may occur from carriers in such cases.

Pathology and Bacteriology.

In every case lumbar puncture was performed, and the cerebro-spinal fluid was examined microscopically and by cultural methods. Most of them showed meningococcal infection. Intrathecal pressure was very high in nearly all cases, and varied between 280 mm. of Hg to 560 mm. The blood pressure was high in a few cases only.

Gordon differentiated four types of meningococci, according to their agglutination and absorption

reactions, all of them closely allied, yet each with its own immunity reactions. The most prevalent meningococcus in this epidemic was of the second type.

During the last three years 18 autopsies were performed. In 15 the usual features of meningococcal meningitis were present. Serous fluid and pus were found in considerable quantity beneath the meninges, and there was softening of the cerebral and cerebellar tissue. In two cases the blood-vessels of the cerebral cortex and the vessels of the pia mater were markedly congested; the meninges were thickened and lustreless. In one case the ventricles were greatly distended, and the brain tissue was much thinned and softened.

Clinical History.

Most of the cases admitted into the hospital were of the fulminating and ordinary types, and very few were of the chronic type. Scarcely any passed into the chronic stage after the adoption of serum treatment. All the cases had the usual classical signs and symptoms of cerebro-spinal fever. The intensity of the different symptoms varied in most cases. Some had marked retraction of the head. Some had severe convulsions, and in others unconsciousness was a marked feature.

Pneumonia was the most common complication. The others were cystitis, bed-sores, and eye complications, such as corneal ulcers, perforation of the eyeball, panophthalmitis, squint, and temporary amblyopia. Those due to serum treatment were swelling of joints, joint pains, and different rashes. The following are the interesting cases illustrating some of the complications:—

CASE 1.—(Perforation of cornea and squint.) Patient, R. M., aged 16, male, was admitted with usual symptoms of cerebro-spinal fever and swollen and painful wrist-joints. Lumbar puncture was performed and serum injected. Temperature came down to normal, but joints were swollen and painful. Lumbar punctures were performed and serum injections were repeated on alternate days. He developed corneal ulcer of the right eye, which later on perforated. Afterwards he got a squint in the left eye, and the swelling of the joints subsided gradually. Then he got a relapse with fever 105° F. and shotty, papular eruptions on the face, hands, and trunk. After a few days the rash disappeared and the temperature came down to normal.

CASE 2.—(Serum rash.) Patient, V. R., male, aged 15, was admitted with the usual symptoms of cerebro-spinal fever and marked retraction of head. Lumbar puncture was performed and serum injected. The patient was restless during the night, but on the next day the retraction was less and temperature was normal. Further lumbar punctures were performed and serum injected on alternate days. Then a punctate hæmorrhagic rash appeared on the face and extremities, and for a week he was a little delirious and complained of headache. He began to improve after one lumbar puncture and serum injection, delirium lessened, headache subsided, temperature came down to normal, and finally he was completely cured.

CASE 3.—(Joint pains.) Patient, L. A., female, aged 16, was admitted with the usual symptoms of cerebro-spinal fever and marked rigidity of neck and delirium. Lumbar punctures were performed, and serum injections were given on alternate days. She complained of severe headache and restlessness during all the days, and five days after the last injection she complained of pain all over the body and the right knee was swollen and painful; it gradually subsided, and she became quite well afterwards.

CASE 4.—(Chronic type.) Patient, D., male, aged 30, was seen with the usual symptoms of cerebro-spinal fever, unconsciousness, delirium, and pain in the chest. Lumbar puncture was done, and serum was injected intrathecally. Very turbid fluid came out under high pressure. It showed many meningococci and polymorphonuclear leucocytes. After five lumbar punctures and serum injections fever came down but fluid was still turbid. The relatives did not allow more lumbar punctures as he was feeling better. After one week he got fever and rigors, which the other consultants declared to be malaria, and he was put on antimalarial treatment, but the fever did not subside and Kernig's sign, retraction of head, stiffness of neck, and unconsciousness reappeared. The serum treatment was started again, and after ten injections on alternate days the patient felt better, fever came down, incontinence of urine and fæces disappeared, and fluid was quite clear after five more injections; during this time he got thrombosis of the right femoral vein and bed-sores on both the hips, for which he was treated; the former were cured but the latter persisted. He got better day by day, but could not walk or see with the right eye. After 14 months he was able to walk on crutches, and five months later he was able to walk with a stick. At present he is well, except for ankylosis of the right hip and loss of vision of the right eye. He had in all 19 lumbar punctures, and treatment lasted for 22 months.

CASE 5.—(Afebrile type.) Patient, K., female, aged 30, had intense occipital headache, retraction of head, and stiffness of neck and photophobia for three days. Later she had dimness of vision. There was no temperature. Lumbar puncture was done. Turbid fluid came out under high pressure, and showed many meningococci. After three lumbar punctures and serum injections, headache and other symptoms cleared up. There was no fever throughout the course of illness of 14 days.

Résumé of Some of the Cases Treated Successfully with Serum.

No.	Initials.	Age.	Sex.	Days of disease when serum was injected.	Total amount of serum injected.	Influence on temperature.
					c.c.	
1	J. M.	45	M.	8, 10	30	L.
2	K. G.	13	M.	6	20	C.
3	K. D.	21	M.	6, 8, 11	80	C.
4	Y. G.	30	M.	15	30	I.
5	P. X.	12	M.	4, 12	40	C.
6	P.	16	M.	2, 5, 8	90	C.
7	K. C.	18	M.	8, 10	60	L.
8	S. M.	18	M.	8, 10, 13	90	C.
9	C. S.	28	M.	9, 10, 12, 14	120	L.
10	J. A.	18	F.	9, 10	60	C.
11	R.	14	M.	8, 11, 13	90	C.
12	V. R.	15	M.	13, 15, 17, 24, 35	150	I.
13	D. R.	12	M.	8, 11, 15	90	C.
14	L. A.	16	F.	6, 8, 11, 13, 16, 18, 27	210	I.
15	A. B.	22	M.	10, 11, 15	90	C.
16	H. A.	18	M.	8, 10, 12, 14	120	C.
17	J. K.	10	M.	6, 7, 9, 11, 17, 19, 22	180	I.
18	G. C.	30	M.	4, 5, 6, 7, 8, 9, 10, 11, 12	250	I.
19	J. S.	22	M.	4	30	C.
20	R. B.	20	M.	8, 9, 10, 11, 12, 13, 14, 16, 19, 26	280	L.
21	S. M.	14	M.	3, 4, 5, 6, 9, 11, 13, 17	205	I.
22	R. M.	16	M.	4, 5, 6, 8, 12, 15, 23, 26, 52	160	C.
23	D. P. G.	18	M.	4, 6, 9, 11, 17, 23, 24, 34, 49	230	C.
24	N. R.	25	M.	1, 3, 5, 9	100	C.
25	N. M.	20	M.	6, 8, 9, 18	70	L.
26	B. S.	25	M.	4	30	C.
27	M. K.	20	M.	11, 15, 17, 22	115	C.
28	S. J.	23	M.	12, 13, 15, 18	115	C.
29	C. L.	25	M.	6, 7, 9	90	C.
30	D.	30	M.	9, 15, 21, 25, 41, 88, 95, 98, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121	380	—
31	K.	30	F.	3, 5, 7	60	—

L. = Lysis. C. = Crisis. I. = Irregular.

Remarks.—1. Herpes. 2. Epistaxis. 3. Complained of pain in the whole body and headache. 4, 5. Rash. 7. Herpes. 9. Painful joints. 12. Serum rash. 14. Joint pains. 19. Neither retraction of head nor rigidity of neck. Severe headache, liver tender. Bronchitis. Kernig's present. 20. Restlessness. 21. Unconsciousness, hypertension in eyeballs. 22. Perforation of cornea and squint, swollen and painful joints. 23. Restlessness and severe pain in head. 24. Blister on the neck. 29. Swelling of neck and subaxillary glands. Pain in all joints. Herpes, panophthalmitis. 30. Unconsciousness, delirium, secondary pneumonia, retention of urine, bed-sores, loss of vision of right eye, thrombosis of femoral vein, ankylosis of right hip-joint. 31. No temperature, marked occipital headache, photophobia.

Prognosis.

It is extremely difficult to give prognosis in such a variable disease. Sometimes apparently hopeless cases with coma recover (Case 4), while others, although looking better, prove fatal owing to sudden change in the inflammatory conditions of the meninges and brain, or to the subsequent development of hydrocephalus. In this series all the fulminating cases died, and ordinary and chronic cases recovered with lumbar puncture and serum treatment from the beginning. The mortality was heavy in infants and adults over 40. As a rule, mortality in this disease

is very high, but general adoption of serotherapy, not only intrathecally but intramuscularly and intravenously, has reduced it a great deal. At the municipal hospitals, out of 55 cases admitted and diagnosed as cerebro-spinal fever from clinical signs only, from January to July, 1921, 45 cases died, showing a mortality of 82 per cent. Later on, out of 96 cases in which lumbar puncture and serum treatment was regularly adopted, 52 died, giving a mortality of 54·2 per cent.

The mortality-rate is much lower in private cases which come under treatment early. Out of 7 of these only 2 fulminant cases died, showing a mortality of 28·5 per cent.

Treatment.

The treatment adopted was mainly specific—i.e., serum treatment; symptomatic treatment was resorted to whenever necessary. All the cases were treated by intrathecal injections of serum. After the lumbar puncture 30 to 40 c.cm. of the fluid was allowed to run out, and an equal amount or little less serum injected by the gravity method. This was done soon after the patients were admitted, and it was repeated daily or every other day. The serum used throughout was of polyvalent type prepared by the Lister Institute. The best serum would have been that from the same strain of meningococcus which was the cause of the disease, but owing to the great difficulties of obtaining such a serum, polyvalent serum was used; although its potency is reduced to about a fourth, it answered the purpose fairly well. The use of the serum caused the turbid cerebro-spinal fluid to become clear; at the same time many patients were cured, the illness was cut short, and there were fewer sequelæ such as deafness, blindness, and paralysis. In symptomatic treatment, the pain was relieved by local withdrawal of blood and counter irritation by leeches on the nape of the neck. The temperature was lowered, and the irritability lessened by applying cold to the head and spine (hydrotherapy) in the form of tepid baths. To allay the spasms and tremors, bromides, chloral, and morphia were given internally. Potassium iodide was given in later stages, and helmitol was administered as an internal antiseptic especially directed towards the cerebro-spinal fluid.

Conclusion.

I agree with Simon Flexner[4] "that the analysis of cases of epidemic meningitis which have been presented furnish convincing proof that the anti-meningococcus serum, when used by the subdural method of injection, in suitable doses and at proper intervals, is capable of reducing the period of illness, of preventing in large measure the chronic lesions and types of infection; of bringing about complete restoration of health in all but a very small number of the recovered; thus lessening the serious deforming and permanent consequences of meningitis, and of greatly diminishing the fatalities due to the disease.

References.

1. Vandyke Carter: Spirillum Fever: Synonyms Famine Fever or Relapsing Fever as seen in Western India, 1882.

2. Trans. Bombay Med. and Phys. Soc., No. 8, 1886.

3. Dimmock: A Report of Cerebro-spinal Fever, with a History of its Occurrence Among the Convicts of the District Jail at Shikarpur, Upper Sindh, Reports of the Inspector-General of Prisons, Bombay, 1885.

4. Simon Flexner: Mode of Infection, Means of Prevention and Treatment of Epidemic Meningitis, Rockefeller Institute for Medical Research, 1917.

HARROGATE INFIRMARY.—On Saturday last Princess Mary laid the foundation-stone of the new building. The total cost will be between £60,000 and £80,000, towards which the medical men of the town have raised £1000.

BY AIR TO HOSPITAL.—The Real Daylight Balata Estates, Limited, in British Guiana, has obtained from England a 'Fairey" seaplane for the rapid conveyance of sick or injured employees from its station at Apoteri to Georgetown, 272 miles distant. The 'plane, which is especially adapted for tropical use, will carry one stretcher case and an attendant.

A CASE OF

INFECTION WITH BACILLUS DYSENTERIÆ (FLEXNER)

PRESENTING UNUSUAL SYMPTOMS.

BY S. F. BREAKEY, M.B., B.CH. BELF.,
RICHARD MURRAY HOSPITAL, BLACKHILL, CO. DURHAM.

With Bacteriological Notes by

F. H. A. CLAYTON, M.D., M.R.C.P. EDIN.

THERE is now sufficient evidence to show that in a certain proportion of cases the symptoms produced by the Flexner bacillus are entirely different from the classical symptoms of dysentery. Savage and Bruce White[1] have recently recorded a definite outbreak of food poisoning due to this organism and a somewhat similar series of cases with sudden onset was reported by Bainbridge and Dudfield[2] in 1911, although on this occasion food poisoning was considered improbable.

In the particular instance about to be described, although the initial history pointed to some acute alimentary trouble, the divergence from the typical picture of dysentery was not so much in this direction as in the rapid development of an intense toxæmia producing a condition hardly, if at all, to be distinguished from the results of some gross cerebral lesion. This finds an almost exact parallel in a case of Flexner infection reported by Marshall[3] in 1909.

There was no opportunity of confirming the diagnosis of infection by examination of the blood or of the organs post mortem, but the fact that the bacillus was readily isolated in considerable numbers from the fæces indicates the extreme probability that the illness was essentially the result of this infection, and this opinion is likewise favoured by the absence of pathological evidence pointing to any other cause for the condition.

As it is desirable that all anomalous cases should be put on record, the following brief account is given.

History of Case.

As the progress of the illness from onset to death was extremely rapid (roughly 30 hours) the history is given in detail.

The patient, L. M., was a female, aged 7, who had, with the exception of such childish ailments as measles and whooping-cough, enjoyed excellent health and was described as a "bright child."

Throughout the day preceding the onset of her illness (Oct. 27th, 1925) she appeared to be thoroughly normal and at bedtime remarked to her father "I am full of 'vital.'" (vitality). She also slept well during the night. Next morning, the 28th, she performed the usual morning routine of breakfast and departure for school and the parents noticed nothing unusual. At midday she was sent home from school, returning unwillingly, the reason given being that "she had been sick." She walked home and for the remainder of the day till 10 P.M. lay on a couch without complaint. She was then given a seidlitz powder and walked upstairs, jumping over a couch en route, undressed herself, and went to bed. Throughout the night, however, she was very restless and "rambled and talked in her sleep." She got up unaided "twenty or thirty times" to go to stool but passed very little, although no blood or slime was noticed and she had no vomiting. Next morning, the 29th, as she seemed "excited and strange in her manner," the doctor was summoned and saw her at 9.30 A.M. when he advised her removal to hospital, where she was admitted at 12.15 P.M. with a suggestion from him that the case might possibly be an acute abdomen.

On admission she was semi-delirious and complained of headache. Knee-jerks exaggerated, pupils dilated, and there was photophobia. Temperature, 102·6° F.; pulse, 140. Decubitus: Left lateral with flexion of thighs and legs. Examination of heart and lungs revealed no abnormality and no rigidity, tenderness, or distension could be found in the abdomen.

By 2 P.M. complete unconsciousness supervened and a small quantity of bile-stained fluid was vomited. Convergent

[1] Special Report No. 92 of the Medical Research Council.
[2] Journal of Hygiene, 1911, xi., 356.
[3] Journal of the R.A.M.C., 1909, xii., 556.

squint of left eye was noted, but there was no retraction of head and Kernig's sign was indefinite. At 2.30 P.M. a soft ribbon stool of yellowish-green colour, homogeneous, non-offensive, and free from visible blood or mucus was passed. This was the only stool observed in hospital and resembled a magnified worm cast. At 3 P.M. retraction of head, twitchings, and spasticity of the limbs, and a markedly positive Kernig were present. Lumbar puncture was now performed and yielded a clear fluid not under tension. A rectal swab was also taken.

From this time the patient passed into an ever-deepening coma, head retraction became extreme, and the pulse uncountable. Death supervened at 5.30 P.M. and a nasal swab was taken immediately afterwards. These three specimens were despatched to the College of Medicine Laboratory at Newcastle-on-Tyne by the evening post.

Post-mortem Examination.

Permission was at first granted for a partial post-mortem only (chest and abdomen) and this was performed at 10 o'clock. The abdominal contents appeared quite normal. The intestines showed nowhere to the naked eye signs of congestion or injection, and the appendix was freely movable and appeared healthy. A slight quantity of clear fluid was present. As the symptoms in hospital had been mainly cerebral and there was little to indicate an intestinal infection, no segment was removed. The heart and lungs were normal. Next morning at 11 o'clock further permission was obtained to examine the brain. This, on surface and section, showed no signs of inflammation, no congestion of vessels, except slightly in the basilar region round the pons, and no pus, turbid fluid, or tubercles.

In the absence of a bacteriological report, and in view of the post-mortem findings, the tentative diagnosis of encephalitis lethargica (fulminating) was made for the purpose of certification.

Bacteriological Notes by DR. CLAYTON.

The three specimens were received from the Richard Murray Hospital, Blackhill, on the morning of Oct. 30th, 1925.

The first was a nasal swab, from which no growth except *Staphylococcus albus* was obtained.

The second specimen was cerebro-spinal fluid. This was an absolutely clear fluid showing no trace of coagulum. An absolute count with a Fuchs-Rosenthal chamber showed a few red but no white cells in 64 squares, and films of centrifuged fluid confirmed this, showing only an occasional lymphocyte with a few obviously contaminating organisms.

Chemical tests, carried out by my colleague, Mr. H. R. Whitehead, gave the following results: Total chlorides, 0·728 per cent.; total proteins, 0·02 per cent.; globulin test, negative. The fluid was consequently reported as to all intents and purposes normal.

The third specimen received was a rectal swab which was covered with what was apparently normal fæcal material without any sign of blood or mucus and which was still moist, despite the fact that it had been collected on the previous afternoon at 3 o'clock. From this MacConkey plates were sown and next day numerous clear colonies were visible. Six were picked off and sown in media containing lactose, glucose, and mannite. As all six organisms produced acid in the latter two and left lactose unchanged, an agar slope sown at the same time was emulsified in saline and tested against the Oxford polyvalent Flexner and typhoid sera. The former agglutinated to 1 in 125 after four hours; the latter showed no trace.

Unfortunately, it was impossible to acquaint Dr. Breakey with these results in time to give him any guidance, as the patient was dead and the post-mortem had been performed almost before the specimens had been received at the laboratory.

As the isolation of a dysentery bacillus was decidedly unexpected and a chance observation, and the time occupied in the transmission of the specimen somewhat prolonged, special care was taken to confirm its identity and the results are given in some detail.

The complete reactions of the organisms when tested for three weeks proved to be those of *B. dysenteriæ* (Flexner). In all subsequent agglutinations the Dreyer technique was adopted and 24-hour peptone cultures were used. The results were read with the assistance of the Oxford dark-ground apparatus and were repeated. With the 24-hour peptone cultures all six strains agglutinated to 1 in 250 with the Oxford polyvalent serum. Tested against the five Oxford strains of Flexner, Z showed no trace of agglutination, X and V agglutinated to about 1 in 50, Y to 1 in 250, and W to 1 in 600. Finally, an antiserum was prepared and when tested against the organism itself this agglutinated to 1 in 10,000. With the Oxford strains it agglutinated W to the same extent, Y to 1 in 2500, and the others only slightly.

Commentary.

This case appears to fall into line with the limited number in which an infection with the Flexner bacillus has given rise to symptoms which are very different from the classical picture of dysentery. Together with Marshall's case it demonstrates the fact that such an infection, like so many other conditions in children, may on rare occasions simulate gross cerebral lesions. An accurate diagnosis was practically impossible until the bacillus had been isolated for, after admission to hospital, the cerebral condition entirely dominated the clinical picture. It is interesting to find that so delicate an organism should have survived in such large numbers the somewhat prolonged journey.

No other occupants of the house partaking of the same food were affected. It was thought that some relative might possibly have been a dysentery carrier, and inquiries made by one of us (S. F. B.) pointed to an uncle of the child as a potential source. She was constantly playing in his house and it was found that he had served about three years in Mesopotamia, and although he himself had only suffered from sand-fly fever, had been in close contact for some months with a dysentery case. His stools, however, proved negative on two occasions.

OBSTRUCTION OF THE ŒSOPHAGUS CAUSED BY A PERSISTENT DUCTUS ARTERIOSUS.

BY A. J. JEX-BLAKE, M.D. OXF., F.R.C.P. LOND.

With a Note on the Condition by

SIR ARTHUR KEITH,

CONSERVATOR OF MUSEUM, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE case set out here, although only that of a lurcher pup which had great difficulty in swallowing, is worthy of record for several reasons. The nature of the œsophageal obstruction was most puzzling and obscure, but a post-mortem examination has revealed the fact that this pup was slowly starved of food and of oxygen by the natural contraction of the ductus arteriosus, and that, if the condition had been diagnosed, relief could have been given by a simple surgical operation. The late Mr. C. B. Lockwood presented to the Museum of the Royal College of Surgeons the thoracic parts of an individual who presented the same anomalies of the aorta and ductus arteriosus as occurred in the case of the puppy recorded here, but in Mr. Lockwood's case there was no difficulty in either breathing or swallowing, because the cord of the ductus arteriosus had undergone a sufficient elongation to allow food and air to pass.

A search of medical literature has not yielded a single case in which the œsophagus was constricted by a ductus arteriosus. As will be seen from the illustration, the œsophagus and trachea passed through an arterial ring or noose, formed by the arch of the aorta to the right, and the pulmonary artery and ductus arteriosus to the left. After birth, as we now know, the ductus arteriosus in this pup became empty, its lumen became obliterated, forming a cord which steadily shortened and thus drew the arterial noose tight upon œsophagus and trachea. A brief description of the specimen will be given by Sir Arthur Keith; here I propose to set out the remarkable clinical history of this case.

Clinical History.

In the course of breeding lurchers near Nairobi, Kenya Colony, the following condition was met with in a puppy. A litter of ten was born in September, 1924, the dam being an imported pedigree English greyhound, the sire a crossbred lurcher from an English greyhound bitch by a French pointer dog. Seven of the ten puppies were kept, all appearing to be normal in every way. After the third week it was noticed that one of them, named Hubert, was

often sick in the middle of suckling. After the fourth week the dam's milk was supplemented with feeds of bread-and-milk two or three times a day, and Hubert was seen to be almost always sick in the middle of these meals, immediately lapping up the vomit. He seemed to have pain in the abdomen before vomiting, and sometimes scratched at his neck with his front paws just before he did so. None of the other six puppies was ever seen to be sick. The dam went dry after the sixth week, by which time the litter was being fed on milk, rusks, sweet potato, and meat given thrice daily. In spite of the frequent vomiting Hubert did pretty well for the first six weeks, as is shown by the following table of the puppies' weights in ounces:—

At birth.	Age in weeks—	1	2	3	4	5	6	7	8	10	17
oz. 15	Hubert	27	43	56	78	104	114	113	150	222	560
15½	Average of six other puppies..	31	59	68	83	111	143	168	203	250	496*

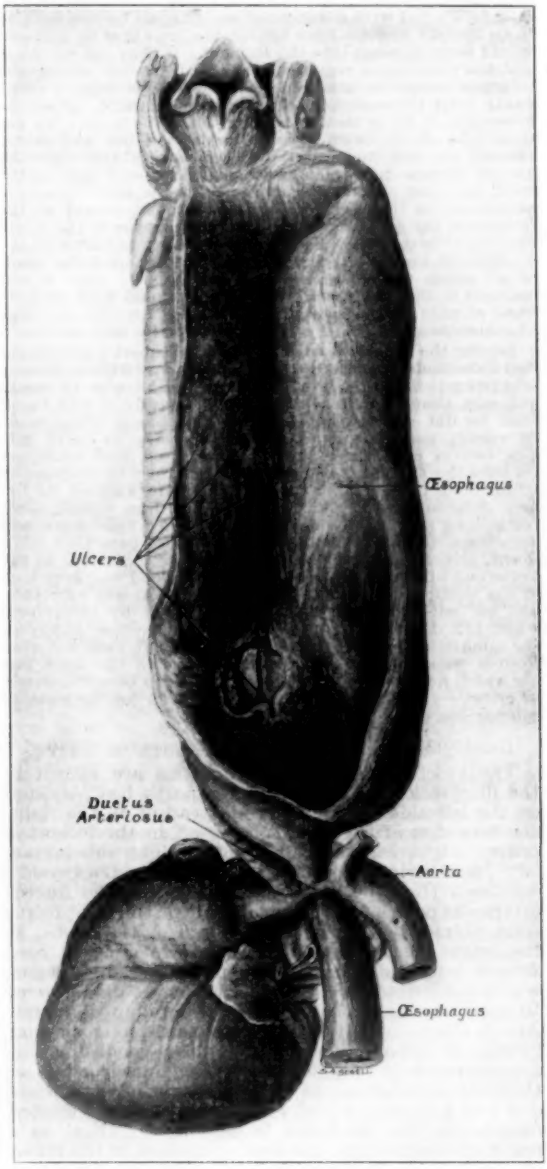
* Weight of one puppy only.

It will be seen that during the seventh week Hubert lost an ounce in weight, while the other six gained on an average 25 oz. each. At this time he was usually vomiting two or three times in the course of each meal, snuffling much through the nose, and making rattling noises in his throat which ceased when he had been sick. There was no cough and no discharge from the nose. With the idea that he might have worms (flat or round, common in Kenya puppies) he was dosed twice with Sewell's santonin mixture, but without either improvement or the evacuation of any worms.

Up to this time no diagnosis of the cause of the vomiting had been made. When he was seven weeks' old it was noticed one day after a meal that Hubert had developed a soft, symmetrical, bulging and fluctuating tumour in the lower part of his neck, behind the wind-pipe and going down below the sternum. This tumour disappeared when, after much palpation of the neck, he was sick and brought up about 2 oz. of unaltered bread-and-milk taken two hours previously and only faintly acid to litmus paper. It was then apparent that there was some obstruction about the lower part of the food-pipe, and it was thought that this was probably due to spasm at the cardiac end of the œsophagus rather than to the pressure of some new growth. He was accordingly put on to a special fluid diet of milk, raw eggs, sugar and small pieces of butter, beaten up together and given four or five times a day, together with five or six drops of tincture of opium in each feed to relieve the supposed spasm. During the next (the eighth) week Hubert put on 37 oz. in weight, the other six puppies averaging an increase of 35 oz., showing that the new diet was a success; there was very little vomiting. How far the tincture of opium contributed to this success seemed doubtful, as it appeared to have no general effect on the puppy whatever, and after nine or ten days it was discontinued. At this time, and subsequently, Hubert was running about the kennel and large enclosed yard with the other puppies, and it was not always possible to prevent him from getting hold of scraps of their solid food and bones from time to time; these he used to bring up again, but his own feeds he mostly kept down. He also used to get solid food occasionally from his dam, who would jump into the puppy enclosure at odd times soon after her own meals and vomit up without effort a quantity of her dinner; this was always ravenously devoured by the puppies at once, although they might have been unable to finish their own dinners a few minutes previously. Twice Hubert was seen to bring up gobbets of meat and sweet potato got hold of in this way soon after he had had his own fluid dinner; on each occasion his own dinner failed to reappear, showing that it had got safely through the œsophageal constriction into the stomach.

At the end of the ninth week he was given some meals of boiled maize-meal porridge and milk, which were gulped down hastily and tended to fill up his œsophagus; it was found that if he was then held up in an upright position, and his neck was gently stroked, the œsophagus would slowly and jerkily empty itself into the stomach with a mixture of gurgles and clicks, Hubert meanwhile making swallowing movements with his pharynx. No œsophageal peristaltic movements could ever be detected in his neck.

Much time and trouble were devoted to his feeding, and during the tenth week he put on 46 oz., five others of the puppies increasing by 25 oz. each on the average. At this time and for the rest of his life Hubert was a particularly lively and well-liking puppy, full of character, always hungry, and, like other puppies, constantly picking up and swallowing scraps of all sorts, bones, small stones, lumps of earth, grains of maize, leaves, grass, cow-dung, pellets of goats'-dung (always particularly attractive, it seems), and so forth, when running about the farm and garden and when out walking. These solids, of course, blocked and distended his œsophagus, and the distended œsophagus



Drawing (7/12 natural size) of the œsophagus, trachea, and heart of a lurcher killed when 17 weeks old. The œsophagus and trachea are seen to pass between the ductus arteriosus, exposed on the left, and the arch of the aorta which passes to the right of these two structures. The ductus constricts the œsophagus, which is greatly dilated and hypertrophied above the side of constriction. The trachea is also caught within this vascular ring and its lumen is reduced to half the normal diameter. The dilated part could hold 23 oz. in life.

would press on his trachea and deform it against the back of his episternal notch, with the result that his breathing became very wheezy and noisy and his activity diminished. He would then stand still with his fore legs splayed out, his head forward, and his mouth a little open, wheezing; sometimes in the course of a walk, when he was in this state, one could lead him to fill up full on cow- or horse-dung, the only available pabulum, and then, holding him upside

down, get him to vomit the lot; this being successfully accomplished he would recover his breath and his activity at once.

After the twelfth week Hubert had three meals a day, and a routine developed in their administration. His neck was first examined for signs of distension of the œsophagus, and if this seemed absent he was given his fluid meal. If this did not go down, but began to bulge out his œsophagus, or if he started with a distended œsophagus, he was held up in an upright position for a time in the hope that its contents would work through into the stomach. If they did not do so and the œsophagus remained distended, he was encouraged to gorge himself on maize-meal-and-water porridge (a cheap food) until the œsophagus was distended right up to the lower jaw, until, in fact, he was full up to the neck. He was then held upside down over an empty pie-dish and gently shaken up and down until he was sick; the vomiting almost always took place without effort and in a single rush, and last of all would come out some solid substance picked up in the farm or garden that had lodged at the bottom of the gullet and prevented the passage of the liquid food into the stomach. He seemed unwilling to part with the contents of his œsophagus, and could not be made to vomit at all unless the œsophagus was pretty full; once it was emptied in the way described above he would take his fluid meal of milk, eggs, sugar and butter, or his thin porridge of maize-meal and milk, with great appetite and success.

During the last three weeks of his life Hubert's œsophagus had to be cleared out before meals in this way with increasing frequency; it held about 11 oz. when he was 12 weeks old, and about 23 oz. at 17 weeks. Latterly it was found that he did not always clear his œsophagus when made to vomit, and that it might be necessary to make him sick two or even three times before liquid food could get on into the stomach, so that it took half or three-quarters of an hour to feed him. At 17 weeks he weighed 35 lb., and it became rather an effort to hold him upside down for as long as might be necessary to induce vomiting; and sometimes the liquid food seemed to cause pain as it went down, giving rise to the suspicion of some ulceration at the lower end of the œsophagus, though no blood was ever seen in the vomit. It was felt that his condition was incurable, and so, with great regrets, he was killed by chloroform when 123 days old. At the same time another puppy of the same litter, named Hannah, weighing 32 lb., and suffering from a recent slowly progressing paresis of the hind legs for which no cause was found—it may have been traumatic in origin—was chloroformed, and dissected for purposes of comparison.

Description of Specimen by Sir ARTHUR KEITH.

The chief structural abnormalities are shown in the illustration. The arch of the aorta has persisted on the left side—as in birds—instead of on the right, the branches of the arch coming off in the following order: right carotid, left carotid, right subclavian, left subclavian, just as in Mr. Lockwood's specimen (No. 566.1, R.C.S. Museum). The ductus arteriosus passes across the left side of the œsophagus from pulmonary artery to the arch of the aorta, at the origin of the left subclavian, forming a cord 20 mm. long and 5 mm. in thickness. The œsophagus, where constricted by the ductus, has a diameter of 10 mm., its lumen being only 3·5 mm. in diameter. Above the constriction the œsophagus has a circumference of 150 mm., whereas in the normal dog this measurement is only 60 mm. The muscle coats of the retrotracheal part of the œsophagus of the normal dog had a thickness 0·02 mm., whereas in the dilated œsophagus the thickness is 0·05 mm. Thus, as a result of constriction, the muscular coats in the retrotracheal segment of the œsophagus of the ailing pup had undergone a hypertrophy of about six times the normal amount. The mucous coat had also undergone a general thickening, expansion, and hypertrophy, and had become infected and ulcerated at many points. The dilatation of the œsophagus pressed upon the trachea, particularly the part above the arch of the aorta, so that this part, and particularly the segment which is engaged within the arterial ring or noose, was only 12 mm. in diameter, whereas in the normal dog of the same age it was 18 mm. in diameter.

The case is very remarkable in many ways, for it is not often we find Nature killing her progeny by her own devices. Normally the arch of the aorta and ductus arteriosus lie on the same side of trachea and œsophagus, but in this case they formed a ring round them. It was not until the pup was three weeks of age that symptoms of œsophageal obstruction were observed; obliteration and shortening of the ductus arteriosus proceeded apace in the second week, and by the third the ductus began to constrict the œsophagus. Much has been written as to the clinical manifestations of a persistent ductus arteriosus, but this appears to be the first case in which it was found to have caused death by constricting the food and air passages. The dissection represented in the figure was made from Dr. Jex-Blake's specimen, and is preserved in the teratological section of the R.C.S. Museum, its number being 566.15.

Clinical and Laboratory Notes.

EXCESSIVE INSULIN DOSAGE IN DIABETIC GANGRENE.

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IN THE LANCET of May 23rd, 1925, Dr. Carrasco de Formiguera has criticised the use of doses of insulin in cases of diabetes with infection, which failed to make the patient sugar-free and to maintain a normal blood-sugar content. That the use of large doses of insulin in such cases may be not only expensive and needless, but actually dangerous, should be remembered by physicians, and for this reason I wish to record the following case, seen in consultation at some distance from Boston, on Dec. 27th, 1925.

Housewife, aged 51 years. Diabetes was discovered in 1914, and she had been treated by various physicians during the intervening period without satisfactory coöperation on her part. Four weeks previously, because of a black, painful toe on the right foot, she entered a hospital where the treatment of diabetes is an exception. Her temperature was 101·6° F., and the urine contained 2·7 per cent. of sugar. The toe was amputated on Dec. 5th, but the fever continued. The wound did not heal, and three weeks later the leg was amputated below the knee. Fever still persisted. The stump became discoloured and gangrenous, and the patient became weaker. Although the urine had been sugar-free constantly after the third day in the hospital, the dose of insulin was steadily increased in the attempt to get a normal morning blood-sugar. The following table, kindly placed at my disposal, gives the analyses up to and including the date upon which I was first consulted.

Fatal Hypoglycæmia with Sepsis and Uræmia.

Date. 1925.	Urine sugar per cent.	Blood-sugar per cent. fasting.	Temperature. Degrees F.	Insulin daily. Units.
Nov. 30th ..	2·0	0·40	101·6	—
Dec. 4th ..	0	0·14	101·2	60
„ 5th ..	0	0·20	100·0	60
„ 7th ..	0	0·25	101·4	60
„ 8th ..	0	0·19	100·4	65
„ 9th ..	0	0·14	102·2	75
„ 10th ..	0	0·13	101·4	75
„ 15th ..	0	0·21	101·2	75
„ 18th ..	0	0·20	101·0	105
„ 21st ..	0	0·22	102·8	105
„ 23rd ..	0	0·20	98·0	105
„ 25th* ..	0	0·24	100·4	230
„ 26th ..	0	—	99·0	240
„ 27th† ..	—	0·015	—	120

* Non-protein nitrogen of the blood 86·0 mg. per 100 c.cm.
† Non-protein nitrogen of the blood 185·0 mg. per 100 c.cm.

Examination revealed an apparently dying woman, eyes rolling, stomach contents drooling from the mouth, almost pulseless, unresponsive, but with moist skin. Hypoglycæmia was diagnosed. A blood specimen was drawn immediately for chemical analysis, and with the same syringe and needle 10 g. glucose in 50 per cent. solution were given intravenously. She responded promptly, and within a few minutes answered questions rationally. Within an hour she again relapsed, and a second intravenous injection of glucose gave immediate improvement. Later, I understand, a third relapse followed, and she died before glucose could be given.

The blood-sugar percentage at 5.30 P.M. immediately before the first injection of glucose proved to be 0·015.

Fortunately, although the immediate cause of death was clearly hypoglycæmia due to an overdose of insulin, one can honestly state that the prognosis was already hopeless owing to the sepsis and uræmia. On one day in September, 1925, in the wards of the New England Deaconess Hospital, 15 diabetic patients were under treatment for gangrene or infections of the feet. Six required no insulin, and the average dose of insulin for the other was but 16 units a day. It is rare that a diabetic patient, except in coma, requires 50 units of insulin a day for more than a few days. An abnormally high blood-sugar before breakfast does not justify large doses of insulin throughout the day unless the urine continues to contain sugar, or the blood-sugar percentage is at all times above normal. When large doses of insulin are being given, the blood-sugar should be determined not only fasting, but also in the late forenoon or mid-afternoon as well until one is familiar with the case.[1] A safe and simple rule for the use of insulin in the presence of infection when examinations of the blood cannot be made is to test the urine before each meal and at 10 P.M., and give insulin at these times only if sugar is present. If the urine is sugar-free and hyperglycæmia is later proved present, a moderate increase in insulin may be used.

A CASE OF PNEUMOCOCCAL MENINGITIS
ORIGINATING FROM AN OCCULT SINUSITIS.

BY ISABEL FALCONER KING, M.B. EDIN., D.P.M. LOND.,
SENIOR ASSISTANT PHYSICIAN, RUBERY HILL MENTAL HOSPITAL, BIRMINGHAM.

IN this case the course of the disease was extremely rapid, the origin of the infection from the sinusitis was very definite, and the existence of the sinusitis unsuspected.

E. H., a woman aged 36, a case of dementia paranoides, who was apparently in good health save for some shortening of cardiac diastole, during the first week of January, 1926, was noticed to be slightly irritable in temper—a most unusual state for her as she was of cheerful habit and tended to be exalted—but made no complaint of illness.

Jan. 7th: Early in the morning she vomited and complained of headache. Temperature, 97·4° F.; pulse, 80; respiration, 20. She was kept in bed. At 6 P.M., T. 103°; P., 96; R., 24. No localising signs were found on examination.

8th: 10 A.M.: T., 101·4°; P., 96; R., 24. She was restless, confused, and resistive, but did not yet present any localising signs. At 6 P.M., T. 100·2° F.; P., 106; R., 24. Kernig's sign positive on both sides and head retraction present. She was much confused and very resistive, lumbar puncture being impossible.

9th: 1.50 A.M.: She had a convulsion of an apoplectic character. After this she was comatose, the respiration being stertorous and tending to Cheyne-Stokes in type. The pulse was full and bounding. There was paralysis of the left face and right arm and leg. The plantar reflex was extensor on the right. There was skew deviation of the eyes. The pupils were contracted, equal, regular, and non-reactive. 10 A.M.: T., 102°; P., 98; R., 36. 6 P.M.: T., 101·8°; P., 122; R., 38. During this time she became rapidly worse. The plantar response became extensor on both sides.

The coma deepened, and she died on Jan. 10th at 12.30 P.M. T., 108·2°; P., 98; R., 44.

Autopsy.—The body is well nourished and shows the usual post-mortem rigidity and lividity. There are no bed-sores nor external signs of injury of recent origin. The skull cap is normal. The brain surface is the seat of a diffuse generalised leptomeningitis, the sulci being filled with greenish pus. The tip of the right frontal lobe is adherent to the frontal plate of the ethmoid and to the cribriform plate. The basal subarachnoid spaces are full of greenish pus. The substance of the brain shows no macroscopic lesion. The right frontal, right ethmoidal, and the sphenoidal sinuses contain pus, most marked in the last named. The cerebral vessels are healthy except in so far as they are surrounded by pus leading along the various sulci. The myocardium is somewhat fatty. The endocardium is healthy except for some roughening of the tricuspid cusps. Aorta and coronaries normal. Lungs show no definite pathological change beyond some œdema of both bases. Nothing noteworthy in abdominal viscera.

Bacteriological Report.—Swabs from brain, frontal, ethmoidal, and sphenoidal sinuses; direct smears all showed a Gram-positive capsulated diplococcus which was overgrown by contaminating organisms on cultivation.

The fact that there were no signs or symptoms to suggest a sinusitis during life is interesting.

I am indebted to Dr. T. C. Graves, medical superintendent of the Rubery Hill and Hollymoor Mental Hospitals, for permission to publish this case.

[1] Jonas, Miller, and Teller: Arch. Int. Med., 1925, xxxv., 289.

SCARLET FEVER ANTITOXIN
IN A CASE OF ENDOCARDITIS AND MYOCARDITIS.

BY E. S. TOOGOOD, M.A. OXF., M.R.C.S. ENG.,
CORONER FOR EAST CORNWALL.

THE following case of a severe infection of the heart, in which treatment with scarlet fever antitoxin was used, and was followed by complete recovery, appears to be worth recording.

The patient, a girl of 11, had contracted diphtheria at school and was discharged from the sanatorium some two months previously after negative throat cultivations had been secured. When I first saw her she was suffering from an acute tonsillitis which responded to treatment on the usual lines. Three weeks later I was called in again as she had developed another sore-throat and had a temperature of 102° F. The temperature was maintained for several days at this level, with slight morning remissions; the pulse-rate was persistently raised, being 132 to 144, the heart was dilated, and a double bruit was audible at the apex. The tonsils quickly cleared up under treatment, but the cardiac signs remained unaltered and a tentative diagnosis of carditis, involving both the endocardium and the myocardium, was made. This was confirmed by Dr. A. B. Soltau, of Plymouth, who suggested the trial of scarlet fever antitoxin, as the condition was so strongly suggestive of a streptococcal infection originating in the throat.

Three doses of the serum were given, each of 10 c.cm., at intervals of four and nine days. Careful desensitisation was carried out before the first dose was given, having in mind the fact that the child had quite recently had anti-diphtheritic serum, and no anaphylactic symptoms ensued. Shortly before the second dose of serum typical petechial spots appeared, but these quickly faded after the second dose. Immediately after the second dose the temperature began gradually to subside, reaching the normal in a few days, and only rising again to 99° for one day after the third dose. The pulse-rate took longer to fall to normal and did not reach 80 for seven weeks. The cardiac bruits disappeared entirely, and the child, when seen quite recently, was in her usual normal health, with no discoverable cardiac lesion.

Considering the severity of the infection, and the grave prognosis which was given, the prompt response to the use of the serum (Parke, Davis and Co. preparation was used) was striking, and it suggests that this method of treatment may be of great value in dealing with these very grave conditions.

DONATIONS AND BEQUESTS.—Miss Mary Dorsett Foster, of Bloxwich, Staffs, left £735 to the Royal Orphanage, Wolverhampton, and £100 each to the Walsall General Hospital, and the Walsall Victoria Nursing Institution.—Mr. John Henry James Hornsby, of Cuckfield Park, Sussex, after several personal bequests, left all his other property, which amounts to about £60,000, "for such charitable purposes and objects as I shall hereafter by codicil direct, and in default of, and subject to any such directions, as my trustees in their uncontrolled discretion shall decide." No such codicil is filed with the will.—Mr. Robert Dixon Steele, of Prenton, Cheshire, retired chemical manufacturer, left over £7000 to charities, including £1000 each to the Liverpool Royal Infirmary, the David Lewis Northern Hospital, the Liverpool Royal Southern Hospital, and the Liverpool Stanley Hospital; £500 each to the Liverpool Maternity Hospital, the Hospital for Women, Shaw-street, the Children's Convalescent Home, West Kirby, and the Royal Liverpool Seamen's Orphanage.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT NOTTINGHAM.

(*Continued from p. 500.*)

SECTION OF LARYNGOLOGY AND OTOLOGY.

WEDNESDAY, JULY 21ST.

Dr. BROWN KELLY (Glasgow) presided over this Section. The first morning was devoted to a discussion on the treatment of

MALIGNANT DISEASE OF THE UPPER AIR AND FOOD PASSAGES.

Mr. F. J. STEWARD (London) read the opening paper, in which he dealt with the principles of surgical treatment. He discussed the subject under four headings: (1) Selection of Cases, (2) Preparation, (3) Operation, (4) After-treatment. In selecting patients for operation it was convenient to divide them into three groups—favourable, doubtful, and hopeless. Doubtful cases made up about 50 per cent. of the total number seen, 40 per cent. being practically hopeless when brought up, and less than 10 per cent. being really favourable cases. As to preparation, while recognising the extreme importance of oral sepsis, he was inclined to favour methods less drastic than those considered imperative by some operators in recent years; he recommended painting infected tonsils with 1 in 500 chinosol in glycerine. In connexion with the operation, he advocated the use of the intratracheal insufflation of ether; he reviewed the methods of approach in various regions, emphasising the importance of repairing the wound as a definite third stage of the operation. As to after-treatment, he recommended feeding by passing a soft rubber catheter obliquely through the wound in the neck into the pharynx. The pharyngeal wall and skin should be fixed tightly round the catheter so that it does not slip out and there is no leakage.

X Rays.

Dr. ROBERT KNOX (London) gave an account of the treatment by means of X rays in these regions where the small area containing a large number of structures makes it difficult to restrict the beam of rays accurately to the parts under treatment. It was essential, further, that the skin and subjacent tissues should not be damaged, and the limited depth of tissue available presented another difficulty. At the present time higher voltages enabled a greater intensity to be applied at a given depth, whilst working at a greater tube distance. Filters on the skin of 2 to 10 cm. of wax aided the operator in giving a strong dose at a depth with no risk of damage to the skin. The exact technique applied on these principles was described by Dr. Knox, and also the method of estimating the appropriate dose, which was usually given in fractions at short intervals. The results, he said, had now greatly improved. He recommended pre-operative treatment in cases complicated by widespread glandular involvement. In inoperable cases X rays were used with no hope of cure but to alleviate symptoms, with a certain measure of success. The outstanding feature in the improved technique had been the recognition that it was neither necessary nor advisable to adopt the lethal dose of Seitz and Wintz as the unit of effective dosage, but to take this as a unit of measurement of the total dose, which would be spread over days, weeks, or months, according to the urgency of the case.

Radium.

Sir WILLIAM MILLIGAN (Manchester) discussed treatment by means of radium, and foreshadowed the time when, with improved technique and a more accurate knowledge of dosage and duration of exposure, radium would be used in operable as well as inoperable cases. For the present his remarks were confined to the vast and distressing array of inoperable cases. There were two schools: (1) those who believe in large doses and short exposures; and (2) those who believe in small doses and long exposures, to which latter Sir William Milligan himself belonged, the exposures being continued up to 10, 14, or even 21 days. The conclusions which he had reached were as follows: (1) that in the present state of our knowledge surgical removal of a malignant growth should be undertaken if a practical proposition; (2) that the lymphatic nodes into which the lymph stream from the growth drains should be removed by dissection or by block dissection; (3) that the lymphatic vessels between the growth and the infected nodes should be irradiated either from within or by external irradiation, preferably by the former method; (4) that the growth to be irradiated should, wherever possible, be exposed so as to admit of its being handled; (5) that the introduction into the growth of a large number of seeds containing small doses of emanation to be retained in situ gives even better results than the implantation of screened tubes; (6) that the introduction of the seeds should follow a definite mathematical plan; (7) that as the periphery of the growth is reached the emanation dose may be reduced; (8) that ligation of the main artery to the growth should invariably be carried out.

Surgical Diathermy.

Dr. W. S. SYME (Glasgow) said that the value of surgical diathermy in the treatment of malignant disease of the mouth and throat decreased as the site of the disease descended from the alveolus to the œsophagus. The most suitable cases were those confined to the mouth, including the tongue, jaws, palate, fauces and floor of mouth. Dental sepsis must be treated as for an ordinary operation. As diathermy would not seal larger vessels, one or both lingual arteries or one or both external carotids might have to be ligatured. A preliminary tracheotomy might be advisable. Affected glands should be removed before or after the main operation. In some cases glands which appeared to be inoperable become operable after the removal of the primary growth and the sepsis attendant on it. In dealing with the growth itself the aim should be complete removal, first coagulating the tissue all round the tumour and then removing it, or its destruction in situ. The former was the better method. In inoperable cases, however advanced, much relief followed surgical diathermy. While diathermy caused remarkably little immediate shock, delayed shock could not be excluded, and experience taught that care must be exercised in regard to the duration of exposure to the diathermy current at one time. Dr. Syme gave statistics of 122 cases treated by this method during the four years 1922–25. Of these 39 were alive on May 31st, 1926, varying from over six months to over four years after operation, 13 having survived for more than three years without recurrence. He claimed that in the treatment of malignant disease of the mouth the method of removal by diathermy was preferable to any other.

In the discussion which followed these four papers a large number of visitors took part, including Dr. WILLIAM HILL (London), who gave a demonstration of the technique of applying radium in the treatment of œsophageal cancer, and Prof. H. NEUMANN (Vienna), who spoke of the use of intravenous injections of sugar as an auxiliary to X ray treatment.

In the afternoon Mr. A. R. TWEEDIE and Mr. BELL TAWSE showed laryngological cases, including many which had been successfully treated by operation for malignant disease. These patients, amongst whom was a man with an unusually large pharyngeal pouch, formed the basis of a discussion.

THURSDAY, JULY 22ND.

The second morning was spent in a discussion on the

AFTER-TREATMENT AND RESULTS OF MASTOID OPERATIONS,

Mr. NORMAN PATTERSON (London) presiding. The opening papers by Mr. G. J. JENKINS (London) and Mr. J. S. FRASER (Edinburgh) dealt respectively with operations for acute disease and with the radical mastoid operation.

Operations for Acute Disease.

Mr. Jenkins insisted upon the importance of adequate drainage, and pointed out that primary suture with or without the use of antiseptics sometimes fails, and that such a failure might prove to be a matter of grave concern. Primary suture was not likely to succeed, and was unsafe when extensive irregular cavities prevented the soft parts from being brought into intimate contact with the deep bony parts. If this method was attempted it should be only in cases where the soft tissues fell in contact with the bone. There were two other considerations, the general condition of the patient and the character of the pus. If the pus was thin and watery, indicating inadequate local resistance, primary suture was contra-indicated. Primary suture sometimes failed even in selected cases, and even when it was successful the result was not always satisfactory. Mr. Jenkins advocated treatment by maintenance of an open wound, and he failed to see any advantage in favour of meatal drainage over drainage from the lower part of the mastoid wound. The advocates of meatal drainage appeared to be biased by the pleasant appearance of a healed posterior incision. Mr. Jenkins gave a detailed account of his technique in the management of the post-aural wound, and warmly supported secondary suture which rarely failed if carefully done, and gave the best cosmetic result of any of the methods of treatment.

The Radical Mastoid Operation.

Mr. Fraser, dealing with the radical and modified radical operations, did not favour Bárány's suggestion of omitting the meatal plastic and leaving the post-aural wound open. He recommended making a large meatus by means of Körner's plastic operation. He confirmed the claim of H. J. Marriage that if skin grafts are used the operation cavity heals more quickly, the outline of the inner wall is preserved in almost all cases, that the duration of the treatment is reduced, that a dry cavity results in a larger percentage of cases than with other methods, and that the resulting hearing power is better. If a graft is not applied, he held, the after-treatment is more troublesome on account of the formation of excessive granulations, which grow up from the facial spur and downwards from the cut edge of the attic and aditus. Thus a membrane tends to form about the level of the isthmus, shutting off the deeper part of the cavity. In any case it is necessary to clean out wax and epithelial accumulations at regular intervals. Mr. Fraser gave a valuable statistical record of the after-results of 628 radical operations. After grafting a satisfactory result was obtained in 83 per cent., and the hearing improved in 61 per cent. Without using skin grafts a satisfactory result was obtained in 52 per cent., and the hearing improved in 44 per cent.

Mr. L. COLLEDGE (London) considered that in acute cases it was safer and less likely to lead to recurrence of the disease to close the wound by secondary suture, and preferred to treat large bone cavities by the method of Carrel. After the radical operation, he believed that the employment of Thiersch grafts not only led to quicker healing, but the end-result was better, also the hearing.

Mr. H. TILLEY (London) indicated how the dressings can be made painless when drainage-tubes are used by protecting the wound surface with pieces of oiled silk.

Prof. NEUMANN, in discussing the papers, gave statistics of 800 cases of acute mastoid disease, and demonstrated the surgical anatomy of the part in order to emphasise the importance of a complete primary operation.

Dr. SYME expressed himself an unrepentant advocate of bipp and primary suture.

In the afternoon a demonstration of otological cases was held.

FRIDAY, JULY 23RD.

THE NASAL SEPTUM.

Dr. JOBSON HORNE (London) read a paper entitled the Sorrows of the Septum. He said that the higher the type of race the more frequent was trouble with the septum. There was no hæmorrhage of greater frequency than bleeding from the nose, and no hæmorrhage that was sooner forgotten. Hence the difficulty in obtaining reliable statistics. He had found on inquiry that 142 people out of 1000 had recollection of blood dropping from the nose, obviously a low estimate. Nose bleeding was rather more common in the male than in the female sex; and deformities of the nasal septum were also more common in the male sex. The bleeding-point in the vast majority of cases was to be found in the cartilaginous septum. The human face, in contrast with that of the lower animals, was characterised by being extended vertically instead of horizontally. This characteristic determined the development of the nasal septum, and the septum determined the development of the nose. The structures entering into the formation of the septum in man were subject to delayed or excessive development. The developmental activity continued not only up to puberty, but, in a greater or less degree, some years afterwards. With that activity there was an increase of newly formed blood-vessels, resulting in a greater tendency to epistaxis and to deformities of the septum. The higher the type of race, the more prolonged was the developmental activity and the more common the formation of ridges, spurs, and deflections. The vascularity of the septum was a cardinal point. It would be difficult to mention any condition of the septum that a rhinologist was called upon to treat that was not vascular in origin—for example, hæmatoma, abscess, fibro-angeioma, bleeding polypus, septal thickening, outgrowths, ridges, spurs, crests, and last, but not least, deflections of the septum. Deformities of the septum were found in 80 per cent. of European skulls. Clinical experience taught that some irregularity of the cartilaginous portion of the septum was the rule rather than the exception. So that in the higher types of races the abnormal became the normal. Statistics based upon the examination of skulls of the lower types showed the reverse; the septum was free from deflections and irregularities in 80 per cent. In routine examinations of the nose one frequently met with ridges, spurs, and deformities of the septum in no way material to the case. The nasal symptoms complained of were often quite independent of any irregularity of the septum, and could be completely removed by other means without interference with the septum. Passing to the much smaller group of cases in which interference with the nasal septum was called for, Dr. Horne held that the operation for the removal of the septum by submucous resection was faulty inasmuch as it deprived the patient of a *rigid* septum, and thereby impaired the nose as an organ of respiration, and at times in other ways. The nasal passages after the operation at times were left too patent, the septum too thin, and patients complained of symptoms due to the flapping of the thin membranous septum in the passage of air. Further, in spite of a reduction of the anterior ends of the middle turbinated bodies at the time of the removal of the septum, very considerable hypertrophy of those structures had ensued in some cases, calling for relief from nasal obstruction. General anæsthesia for operations upon the upper air passages, particularly when prolonged, was attended with greater risk after interference with the septum. It was questionable whether the end-results of rectifying the nasal septum by removing it were any better than those obtained by other operations that left the septum intact. The procedure followed by the speaker when orthopædic surgery upon the septum was inevitable was a modification of Moure's operation. In spite of the argument about the resiliency of cartilage he claimed that the operation gave as good results without the unfortunate troubles that have followed submucous resection and removal of the septum. He was in favour of a limited submucous resection for the removal of spurs and ridges.

Dr. Horne's paper provoked an animated discussion, in which 14 members joined, Mr. TILLEY

and Mr. E. B. WAGGETT making useful suggestions as to the causes of the failure of operations on the septum to give benefit or relief in certain cases.

Dr. WILLIAM HILL followed with a paper on

PHARYNGEAL AND ŒSOPHAGEAL DIVERTICULA.

He gave a historical account of the subject, and illustrated his address by a large number of pictures and X ray photographs. He advised the pathological classification of diverticula as follows:—

Solitary Diverticula of Upper Food Tract.

I.—*Pharyngeal in Origin.*

A. *Congenital.*
1. Anterior median branchial diverticular sinuses and pouches. (Rare.)
2. Lateral branchial diverticular sinuses and pouches. (Rare.)

B. *Acquired.*
3. Deep postero-median pulsion pouches. (Not rare.)

II.—*Œsophageal in Origin.*

B. *Acquired.*
4. Traction pouches of Rokitansky. (Not rare.)
5. Leugart's post-branchial ledge pouches.
6. True pulsion pouches. (Usually low down but above level of diaphragm—the epi-phrenic of Starck.) (Rare.)
7. Pulsion-traction pouches of Starck. (Rare.)

Boundary cases at the pharyngo-œsophageal junction, he stated, do not exist.

Dr. E. I. SPRIGGS (Ruthin) gave a detailed record of two cases under his care. They had been long under observation, and had been treated without resort to surgical interference. Dr. Spriggs pointed out the analogy between pharyngeal and duodenal diverticula, of which he had met 43 in a series of 1000 examinations for disease of the duodenum.

Mr. L. COLLEDGE, on behalf of Sir StClair Thomson, indicated the difficulty of classifying pharyngeal diverticula as the symptoms were œsophageal; therefore in a pathological classification they should be included under diseases of the pharynx, but in a clinical or symptomatic classification they came under diseases of the œsophagus.

Dr. W. H. KELSON related the subsequent history of two patients successfully treated by operation: one of these had died from bronchitis, and the other from malignant disease arising in the scar.

The PRESIDENT, speaking from an experience of 17 cases, had noticed that dysphagia is not an invariable symptom, as some patients only complain of hawking and "phlegm in the throat."

Mr. DOUGLAS GUTHRIE (Edinburgh) read a paper based on 20 cases of

ACUTE RETROPHARYNGEAL ABSCESS IN CHILDHOOD.

He said that acute retropharyngeal abscess in the majority of instances was due to suppuration in lymphatic glands, sometimes of tuberculous nature, but more frequently streptococcal. The tonsil was the original source of infection in many cases. Injury during removal of adenoids was a possible cause, as also the direct spread of pus from the middle ear. The majority of patients were under 1 year old, and the disease was commoner in boys than in girls. The condition was very rare in adults. Difficulty of breathing was the leading symptom. This might suggest laryngeal diphtheria and might even lead to the fatal mistake of performing tracheotomy. The larynx in the infant was relatively small, and was situated at a higher level than in later life, so that laryngeal obstruction was usually caused by the abscess, which tended to point just opposite the upper aperture of the pharynx. Difficulty of swallowing was a rare symptom and the characteristic throaty cry, so often described, was seldom heard. Diagnosis was merely conjecture until the throat was examined. Even then it might be difficult to appreciate by inspection alone the altered contour of the posterior pharyngeal wall on one side. Digital examination was the most certain test, but should not be practised without preparation to open the abscess immediately. The condition was often confused with adenoids, and laryngeal diphtheria or a foreign body in the œsophagus might be suspected. Lymphosarcoma might simulate abscess, but was much rarer. Cervical scoliosis caused a unilateral projection of the posterior pharyngeal wall of bony hardness. As soon as retropharyngeal abscess had been diagnosed it should be opened. If left to itself it would cause death from suffocation, or, should the patient survive this contingency, from bronchopneumonia. In the author's series of 20 cases two survived after spontaneous rupture of the sac. External operation should be reserved for the chronic variety due to bone tuberculosis. No anæsthetic should ever be given as it increased the risk enormously. The child should lie on his side firmly fixed in a blanket. A gag was then inserted, and the point of a long sinus forceps plunged into the most prominent part of the swelling and opened in a vertical direction. At the moment of opening the child was turned on his face. Pus flowed from the mouth and nose and relief was immediate. Mr. Guthrie believed that fatalities during the operation would be largely avoided if this method were adopted. In the series of 20 cases described death occurred in three. Two of these died on the way to hospital, and the third just after the abscess had been opened.

SECTION OF DERMATOLOGY.

FRIDAY, JULY 23RD.

Dr. H. G. ADAMSON (London) presided over the deliberations of this Section. The first subject under discussion was

ECZEMA.

Dr. A. WHITFIELD (London), who gave the opening address, recalled Willan's definition of the eruption—"a sheet of minute vesicles, with no tendency to enlarge, not inflammatory in origin, or appearance, and not accompanied by fever—a *condition* rather than a disease, and one which might be called forth by a variety of causes." Dr. Whitfield pointed out that the histological appearances invariably coincided with the clinical manifestations. There is congestion of the capillary loops at the heads of the papillæ, subsequent exudation of lymph, distension of the intercellular channels (spongiosis), and a more or less rapid spread of fluid upwards through the rete mucosum, until a deep-seated vesicle is apparent to the naked eye. It followed that if the exudation be checked at any stage a papule and not a vesicle may be the final result. Eczema therefore consists of vesicles or papules; other forms of dermatitis—e.g., pyogenic, marginated, &c.—which are not constituted by these fundamental elements have no right to the name. Culturally, eczema vesicles were always sterile in their incipience, but secondary infections from skin saprophytes were the rule. In attempting to define the nature of the stimulus responsible for the exudation Jadassohn classified eczematous skins under two heads: (1) those reacting to very small doses of a particular irritant, or a general susceptibility to a number of such; and (2) those which react to substances which in respect to normal skins could hardly be classed as irritants at all. Hence, in eczema there is an irritability special or general, which we may term a susceptibility. It may appear soon after birth or may be acquired later.

The Constitutional Factor.

Dr. Whitfield referred to the type of eczema of the arms, neck and face, which is not infrequently seen as a secondary manifestation due to the sudden irritation and "flare up" of a chronic patch of varicose dermatitis on the leg. This may be quite indistinguishable from ordinary eczema, and will clear up without particular attention if the leg patch is treated and brought under control. Another type of eczema, in Willan's sense, and one which may alternate with urticaria from food poisoning, is a follicular dermatitis of the trunk and extremities mainly. In both these examples there was an under-

lying constitutional factor, which undoubtedly had a bearing on the ætiology. It was in this category that we should place those cases which appear to depend on focal sepsis for their origin, and may clear up permanently when the foci have been discovered and eliminated.

In summarising his conclusions Dr. Whitfield stressed the following three points: (1) Eczema is a clinical condition and not a disease with a single specific cause. (2) It is the result of irritation of the skin, and is associated with an undue susceptibility. (3) This susceptibility may be congenital or acquired, and when acquired may be the result of repeated external trauma or a generalised toxæmia of particular type.

Dr. W. DYSON (Manchester) defined eczema as a non-microbic affection of the skin, produced by external irritation, in a predisposed subject. The predisposition, which implied an abnormal susceptibility to physiological stimuli of all kinds, once acquired, might remain local in a single area, or might spread and become more or less generalised. The stimulus which caused the reaction might be a single specific one at first. Later, specificity might be lost, and the patient's skin respond to all and any variety of what in normal individuals were regarded as the ordinary physiological stimuli of daily life—e.g., light, heat, water, &c.

Dr. Dyson made the further suggestion that the skin itself might occupy in the normal economy a position in some degree resembling that of the ductless glands. The anatomical and microscopic structures did not altogether differ in certain respects. He thought that the therapeutic action of X rays might be to some degree explained by such an assumption. Their action might set free certain substances which, finding their way into the circulation, might there give rise to the production of specific antibodies, which in their turn would have a favourable action on the course of the disease.

Dr. H. W. BARBER (London) as in almost complete agreement with the observations of Dr. Whitfield. He proposed not to discuss the ætiology of eczema in general, but to attempt to differentiate certain clinical types of the eruption with a view to seeing whether it is not possible to deduce the probable cause in a given case from the distribution, configuration, and type of lesion present.

As regards "seborrhœic eczema," he agreed that this was not a true eczema, but an inflammatory reaction of the eczematous type (eczematide of Darier) due to infective organisms, comparable to that produced by a ringworm fungus. But occasionally in seborrhœic patients—particularly in hot weather—an acute true amicrobial eczematous reaction did occur—for example, on the hands and feet. This might be comparable to the third type of "seborrhœic eczema," referred to by Dr. Whitfield as occurring on the back, which he has suggested may be due to irritation by a fatty acid—e.g., butyric acid—produced by bacterial decomposition of sweat. But such an eczema—at any rate when it occurs on the palms and soles—was more likely, in the speaker's opinion, to be due to the actual excretion of fatty acids by the sweat glands, as the palmar sweat is always strongly acid in these cases, although sebaceous glands are absent on the palms and soles. This type of eczema might occur in seborrhœic subjects, apart from any active seborrhœic dermatitis being present. The condition labelled "infective eczematoid dermatitis" by American authors had been shown to be a definite entity due to epidermal sensitisation to a staphylococcus. "Nummular eczema" was characterised by bilateral symmetry of the lesions, the eruption occurring chiefly on the limbs. The primary lesion was often a single eczematous papule which became a vesicle of considerable size, drying up to form a single brownish scab. The nummular patches were more or less circular with sharply defined margins, and were characterised by the relatively large size of the vesicles and resulting scabs and their tendency to remain discrete. The evolution of this type of eczema made it almost certain that the toxin to which the epidermis was sensitised was borne in the blood-stream whether from a focus in the skin itself or from within. True gouty eczema was in these days rare, and should not be diagnosed unless associated with a high blood pressure and abnormal uric acid blood content. There was the type of eczema occurring in patients who had inherited the ichthyosis-asthma-hay-fever-prurigo-eczema-urticaria complex. They had almost invariably suffered from infantile eczema, and later developed circumscribed prurigo. The majority were, perhaps, ichthyotics, but apart from this their skin was curiously sallow, thickened and œdematous looking, so that they could be recognised at a glance.

Dr. A. R. HALLAM (Sheffield) questioned the necessity of external causation in the production of eczema, and believed in the possibility of its occurrence without it. He quoted the experiments of Jaeger (a pupil of Bloch), who applied plasters containing known percentages of certain irritants to a large number of individuals, of whom a proportion were known to be eczematous subjects. Of these 35 per cent. gave a positive reaction in the specific eczematous sense, of the remainder only 5 per cent., and these had therefore to be regarded as potentially inclined to the disease.

Dr. HALDIN DAVIS (London) declared that more research into the internal chemical mechanisms of the body was necessary before an advance in our knowledge of the ætiology of eczema could be made. He had found that some cases could be benefited by the exclusion of sugar in the dietary, and in view of this fact had tested the blood-sugar reactions of some 50 eczematous patients at the Royal Free Hospital. An abnormality in one of three directions was detected in two-thirds of the cases examined. Eczematous subjects appeared to show either (1) a high resting value, or (2) a higher rise after glucose ingestion than is normal, or (3) a slower fall. He thought the nervous system might well be implicated in causation, and suggested that, just as in tetanus, the toxins responsible might travel and distribute themselves by way of the perineural sheaths.

Dr. H. SEMON (London), while admitting the accessory importance of blood states such as hyperglycæmia and gout, and local traumatism in trade or varicose dermatitis in the causation of eczema, could not subscribe to the view that these factors alone or combined were sufficient to produce the classical eruption in subjects who were not predisposed to it. In his view it was necessary to assume the existence of a specialised cutaneous response, which an American author had concisely termed a "tissue idiosyncrasy." Dr. Semon suggested that in view of the fact that skin areas occupied by nævi never showed any reaction when the whole of the rest of the body might be involved in the eczematous response, the actual anatomical structures reacting might conceivably be the vasoconstrictor and dilator nerves, which were known to be altogether lacking in neurovascular structures.

Dr. G. B. DOWLING (London) drew a nosological distinction between eczema and dermatitis, and suggested that the latter term should be retained for that form of skin reaction which was evoked by the irritation of industrial chemicals—e.g., soap or other recognised skin irritant. He thought that constitutional factors must be multiple, and might be congenital or acquired. In the present state of our knowledge it was impossible to recognise or even define the nature of the primary sensitising substances. Some of them might well be produced by autolysis of skin or other tissue. He quoted a recent case of his own in support of the suggestion, in which the patient, who suffered from lupus vulgaris of the face, was treated by pyotropin—a local caustic containing salicylic acid and potassium phenolate. After the second or third application a ring of minute eczematous vesicles appeared round the treated

areas and gradually spread until a typical eczema of the face and neck had developed.

Sir NORMAN WALKER (Edinburgh) noted that only one mention of gout as a causative factor (that by Dr. Barber) had been made on this occasion, and said that in 1892 at a B.M.A. meeting the diathesis had completely dominated the discussion. He thought that everybody must now be convinced of the importance of focal sepsis in causation. Again and again the removal of such a focus had resulted in cure or alleviation of the skin condition. He entirely agreed with Dr. Whitfield's picture of the chronic patch of varicose dermatitis lighted into activity by the application of a strong and unsuitable dressing, and directly responsible for an eczematous outbreak in other parts of the body. With regard to seborrhœic eczema he desired to apologise for the word *Bottle* bacillus, for which as translator of Unna's original paper he must take the responsibility. *Flask* bacillus was the correct translation. Sir Norman Walker was convinced of the considerable importance of internal factors in the causation of eczema, and stated that cutaneous protein tests had been of some use in elucidating them in one or two of his own cases. He was very much in favour of a biochemical training for the future dermatologist, and believed that this offered the best prospect of advance in the science. In conclusion, he uttered a serious warning against the indiscriminate use of X rays in treatment.

The PRESIDENT congratulated Dr. Whitfield on the able way in which he had summarised the present state of our knowledge of the causation of eczema, and expressed agreement with the essential definitions and conclusions suggested in his paper. For his own part he had never been able to convince himself that internal causes had anything to do with the problem of eczema, and in support of that view he instanced the effect—almost invariably successful in his hands—of local treatment in the control of infantile eczema—the purest of all types of the condition, and one in which an almost complete protection against both physiological and abnormal stimuli could be ensured.

In his reply Dr. WHITFIELD stated that in his view eczema could be either a congenital susceptibility or acquired by the effect of repeated trauma. He felt convinced that an external stimulus was of prime importance in the production of the eruption, and instanced in support of that contention the effect of light on the exposed parts—face, neck, and hands—of such patients. He agreed that gouty eczema was a very rare condition, and stated that in the whole course of his experience he had seen not more than 100 cases. He cordially agreed with Sir Norman Walker's warning on the subject of radiotherapy. It had become his practice to record the areas irradiated, and the doses on charts which he gave to all private patients, so that in the event of further treatment by others the charts were available for reference, and due precautions could be exercised.

THE TREATMENT OF PSORIASIS.

A discussion on this subject was opened by Dr. ROBERT W. MACKENNA (Liverpool). He said that since there was still complete ignorance of the cause of this common disease the treatment must be appropriate to the stage and character of the lesion in any individual case. In the acute stages, with new lesions rapidly appearing and developing, the patient should be put to bed, on a light diet, regular purgation, &c. Antimonial wine (7–10 minims t.d.s.), a valuable remedy for acute skin conditions, and too often forgotten, might prove very beneficial, and could do no harm. The speaker had had no success with emetine injections, while arsenobenzol derivatives, administered intravenously, and injections of whole blood (auto-hæmatotherapy) had also proved disappointing in his hands. Mixed coli vaccine in no instance produced involution by its own unaided effect, but in cases which had indicanuria it seemed to have an adjuvant effect in accelerating recovery. A striking example of the outcome of "protein shock" therapy was provided by a nurse under Dr. MacKenna's care in 1922. She had had intermittent psoriasis for 12 years, and this attack was so severe and generalised that she was put to bed and treated as for a severe exanthem. A week later an abscess developed in the axilla, and as this grew and "ripened" the skin lesions faded, pari passu. Dr. MacKenna said that this concomitant septic infection was recognised as a useful ally; he was in no hurry to open the abscess prematurely. The patient did not have another outbreak of psoriasis for 15 months. Imitating this natural form of "fixation abscess" Dr. MacKenna had tried the effect of intramuscular injections of terpichin, an oily compound of purified turpentine and quinine, in doses of 1 c.cm. once or twice weekly. It appeared to quieten the period of acute development and accelerate involution, but in no case did it do this unaided by local treatment. Sulphur colloidal solutions by the mouth were useful, also intramine given intramuscularly, 0·75–1·5 c.cm. weekly, but as with the other injections local treatment had always to be invoked.

Of local treatments X rays appeared to be the most valuable and rapid, but they had the obvious drawback that only a limited number of areas could be irradiated; also that tolerance to X rays might be easily exceeded, and a burn might result if more than one or two doses were given. It ought not to be applied in acute cases, but only to the chronic patch. The drawbacks applying to X rays were absent in connexion with ultra-violet radiations which could be given safely and frequently to the whole body. A successful case was cited in which a series of exposures to an air-cooled mercury-vapour lamp had banished an inveterate eruption in a woman with a 27 years' history.

As regards *diet* nothing definite could be laid down. It had been found that 20 per cent. of psoriasis cases gave evidence of putrefaction in the bowel and 26 per cent. of carbohydrate fermentation. Free purgation, assisted if necessary by high irrigation, seemed to be indicated in such cases, and excess both of carbohydrate and protein in the diet should be avoided. Salicin was admittedly a valuable drug in acute and spreading cases (10–15 gr. t.d.s.), and iodide of potassium had sometimes proved efficacious. Glandular extracts were very disappointing. In local applications it was important to begin with weak concentrations of any drug chosen, and gradually increase when the tolerance had been ascertained. By far the most effective was chrysarobin, while equal parts of tar, glycerole of lead, salicylic and mercury ointments was an extremely serviceable and harmless application when properly used. The combination had a rational basis, for tar and mercury were reducing agents, salicylic acid keratolytic, and the glycerole of lead hygroscopic and soothing. The tenacity and adhesive properties of the mixture rendered it valuable for firm inunction and massage, which in itself appeared to do good in the œdematous type of case. The actual percentage of the various drugs incorporated depended on the stage of the eruption. If acute and spreading rapidly it would be wise to employ weak concentrations, particularly of the tar ointment. The only one of the remedies cited that could be relied upon to cause the eruption to disappear "with precision and promptitude" was chrysarobin, and recurrences after its use were just as frequent as with other remedies. The problem would not be solved until the physiologists and biochemists were able to reveal some of the more intricate processes of cell metabolism.

Dr. DYSON emphasised the importance of rest in bed in acute or intractable cases. In his experience salicin was valuable in the acute stage, arsenic in the chronic. Excessive tar inunction often led to follicular infection, and he was in agreement with Dr. MacKenna in his warning against using chrysarobin in acute cases. Pyrogallic acid was useful for chronic patches. Dr. Dyson had only seen benefit from thyroid when the patient was made ill by excessive

doses. He had had some therapeutic success with a polyvalent staphylococcal vaccine, but had now given it up for curative purposes. He was under the impression (40–50 cases tried) that this vaccine was useful in preventing recurrences. He quoted a nurse who had apparently been saved from relapses by its use for over two years, although previously never free, after renewal of the eruption, for more than six to eight weeks. He had had success with a Danysz vaccine in one or two cases, but he agreed that the results were most uncertain and could never be foreseen.

Dr. BARBER thought ultra-violet light in some cases did more harm than good. He advocated concerted action among British dermatologists to determine the *cause* of psoriasis, and alluded to the frequency of tonsillitis as a precedent to the eruption, especially in rheumatoid cases. In conjunction with Dr. D. Embleton he had found an organism of the streptococcus group in some cases of psoriasis associated with rheumatic symptoms in the joints. In one of these, a very severe case which had gone on to generalised exfoliative dermatitis with high pyrexia, it had been recovered from the blood and cultured. The autogenous vaccine injected immediately checked the fever, and may have been partly responsible for an ensuing cellulitis of the thigh, from which the same organism was cultivated. The patient eventually recovered. Dr. Barber admitted that the cases were at present too few for him to draw any conclusions as to the ætiological importance of a bacteriological cause of psoriasis.

Dr. E. F. SKINNER (Sheffield) said he had made an experimental clinical investigation of the comparative value of chrysarobin and X rays in the treatment of psoriasis. In two selected groups, in which dietetic and other factors remained the same, he was able to demonstrate the definite superiority of the chrysarobin method, both in the rapidity of involution of the individual lesions and in the prolongation of the immunity intervals. The average duration of treatment in hospital by this method was from 20–30 days. In the group selected for radiotherapy one-third of a unit dose was given to each patch. Dr. Skinner showed some slides illustrating both the clinical and microscopic results of treatment. His investigations had led him to believe that a diminished intradermal pressure with increased oxygen tension were invariable associations of the psoriatic lesion. He was not much impressed with the results of ultra-violet ray treatment in psoriasis.

Sir NORMAN WALKER emphasised the fact that there is no generally applicable treatment for psoriasis. Every case had to be treated individually, and long experience was the only safe guide. He entirely agreed with Dr. Skinner in his estimate of the value of chrysarobin. In connexion with tar applications it should be remembered that there were various tars—some derived from coal, some from pitch-pine—and that they were not all suitable in every case of psoriasis. While there was no remedy which could be relied upon as a specific, Sir Norman Walker protested against the practice of giving a bad prognosis. The policy of laissez faire was bad, and the patients must be encouraged to use the best possible means to rid themselves of every ensuing attack.

Dr. WHITFIELD said that he would exercise extreme caution in prescribing arsenic to acute or irritable cases, and in those non-scaly glazed types which were by no means uncommon. He said that when he prescribed arsenic he found it did most good when pushed to the limit of tolerance.

In his reply Dr. MACKENNA expressed himself as much interested in Dr. Dyson's remarks on the preventive effect of treatment by vaccines. He thought that his views, perhaps too optimistic on the results of phototherapy, might have been due to the fact that the majority of his cases were treated in the winter months, at a time when sunlight was deficient.

Reviews and Notices of Books.

CHRONIC RHEUMATIC DISEASES.

Their Diagnosis and Treatment. By F. G. THOMSON, M.D., F.R.C.P. Lond., and R. G. GORDON, M.D., D.Sc., M.R.C.P. Edin. Oxford Medical Publications. London: Humphrey Milford, Oxford University Press. 1926. Pp. 202. 8*s.* 6*d.*

THE appearance of this book is well timed, following the report of the Ministry of Health on rheumatic diseases, in which it was shown that about one-sixth of the total amount of sickness occurring amongst the insured population is due to diseases in this group, and that every seven insured persons cost the insurance funds £1 per annum in respect of these diseases—a total of £2,000,000 per annum amongst our insured people alone. However, students still can and do graduate from our large hospitals with little knowledge of chronic rheumatism beyond the fact that it is a disease prevalent amongst out-patients, and is usually treated with salicylates internally and liniment as a placebo. The authors of this handy volume do not claim to describe any hitherto unpublished original research; none the less, its study will give information which will be new to many.

The book is divided into three parts. The first deals briefly with ætiology, and then describes the clinical types, showing clearly how they differ or overlap. The following reason is given for dropping the name "rheumatoid arthritis" and substituting "focal arthritis." "The name 'rheumatoid arthritis' conveys no suggestion of the main ætiological factor, and may even mislead by suggesting a false relationship to rheumatic fever. On the other hand, the term 'focal arthritis' not only emphasises the underlying cause, but serves as an emphatic reminder to the medical attendant that it is his duty to find out where the infection lies, and to treat it thoroughly and effectively at the earliest possible moment." The nomenclature throughout is simple, and the reader cannot fail to grasp exactly what the authors mean. The clinical descriptions of fibrositis, neuritis, lumbago, the various forms of arthritis and gout are all good. The 24 pages which comprise Part II. deal with common mistakes in diagnosis. Read in conjunction with the clinical descriptions in Part I., they cover the ground thoroughly and supply a reminder that routine physical examination is necessary even of the patient who makes no more than a casual complaint of a touch of rheumatism. Neglect of this precaution may bring serious trouble to doctor and patient alike. Treatment is described in Part III. under the headings drug treatment, hydrology, climate, physiotherapy, orthopædic treatment, vaccines, and diet. It would appear that the authors have not seen the ill-effects from the use of drugs of the atophan group described by other clinicians, otherwise these dangers might have been more stressed. There is a short paragraph summarising the points to be considered by the doctor who is debating whether or not to send his patient to a watering-place. The information under the headings physiotherapy and orthopædic treatment will be quite as useful to the general practitioner as that concerning drug treatment. Not only is it emphasised that joints must be kept in the position of optimum efficiency during acute inflammation, but it is shown how this may be done.

A doctor who has had the depressing experience of seeing a patient become crippled and deformed in spite of his efforts will appreciate the value of the teachings, though even with the knowledge they impart treatment is difficult enough. No enthusiasm is shown for vaccine therapy; protein shock is regarded as still sub judice, but without much promise. The fact that this book is written by two spa physicians has some significance. Although our large mineral water

hospitals do not confine themselves to the treatment of rheumatic diseases, patients suffering from these diseases form the majority of their cases, and, as the urgent routine work of pathological and biochemical departments is less than that of general hospitals, it is to spa institutions that we may look for further advances in our knowledge of these economically disastrous diseases. This book contains all essential information concerning its subject and has no padding. It is light to hold, and is well produced.

MEDICAL DIAGNOSIS.

Sixth edition. By CHARLES LYMAN GREENE, M.D., formerly Professor of Medicine and Chief of Medical Clinic, University of Minnesota; Chief of Staff, St. Luke's Hospital. London: William Heinemann. 1926. Pp. 1468. £3 3s.

THIS costly and richly illustrated volume should prove attractive to the studious medical man who wishes to possess a work on general medicine which escapes from the usual format of text-books. Dr. Lyman Greene is well qualified to produce such a work, both by a wide experience and a clear style of writing. After sections dealing with fundamental principles and case-taking he discusses in detail the methods of investigating and the clinical features of diseases of each system of the body. If there is a major criticism to be made, it is that the space devoted to the cardiovascular system is disproportionate to that given to other parts of the body. This portion of the book is filled with accurate observations and readable descriptions, and the author has expressed his personal views with a fearlessness which must commend itself to critics. But the general reader may yet be disappointed at the relatively small amount of space devoted to other important sections, notably to diseases of the lungs and to abdominal diseases. As is always the case with books of this magnitude, the laboratory methods, sometimes described in great detail, may be out of date by the time they reach the reader; thus page 999 contains full description of the original Rosenthal test for hepatic efficiency; the method is here placed alone under the heading Determination of Liver Function, whilst a footnote only refers to the method which has since completely supplanted the one described. Still more surprising to English readers will be the omission of reference to the van den Bergh test or to cholecystography, whilst many less important methods of examination are prominently recorded. But such omissions are inevitable in a production of this size by one observer, and we are well content to ignore them in a work which carries such a strong individual message.

ORTHOPÆDIC SURGERY.

By W. A. COCHRANE, M.B., Ch.B., F.R.C.S. Edin., Assistant Surgeon, Edinburgh Royal Infirmary; late Clinical Assistant, Orthopædic Department, Massachusetts General Hospital, Boston, U.S.A. Edinburgh: E. and S. Livingstone. 1926. Pp. 528. 21s.

THIS book, written by an Edinburgh surgeon, is largely inspired from American sources, and gives prominence to views and lines of treatment to which little attention has been paid in this country hitherto.

Following the lead of Joel E. Goldthwait, a school has arisen in the United States which attributes much more importance to the effects of posture than has been admitted elsewhere. Whether or no bad carriage of the body is more a cause than a result of abnormality, it is time that the profession in Great Britain should have the arguments in favour of Dr. Goldthwait's conclusions adequately put before them. These Mr. Cochrane has well presented in Part I., which includes also chapters on physical education and reconstruction. The rest of the book deals, by means of a regional and not an ætiological classification, with disabilities and affections which Mr. Cochrane includes under the six heads into which he has divided the surgery of the locomotory apparatus, a title hardly comprehensive enough to cover all the domain. Beginning with the feet and ankles, the author takes his readers to the knee, hip, spine and thorax, shoulder, elbow, and hand and wrist, to reach in the final chapter torticollis, acute anterior poliomyelitis, and spastic paralysis. Fractures in the neighbourhood of joints, such, for instance, as those of Colles and Pott, receive attention, but for information about fractures in general the reader must turn elsewhere and then could not do better than consult the joint work on Fractures and Dislocations of Wilson and Cochrane, published in 1925. Trauma and disease of the sacro-iliac joints are conditions to which much more attention is paid in certain schools of surgical thought in America than in Europe. Such injuries must be much commoner in New England than here, or else their occurrence is here overlooked. Mr. Cochrane gives a good description of the symptoms and morbid appearances on which American surgeons rely, and his account of this subject should arouse attention to these conditions in Great Britain.

This book is well printed and illustrated, and it offers in a handy form a useful guide for practitioners in the treatment of orthopædic cases.

CARBOHYDRATE METABOLISM AND INSULIN.

Monographs on Physiology. By JOHN JAMES RICKARD MACLEOD, F.R.S., M.B., LL.D. Aberd., D.Sc. (Hon.), Professor of Physiology, University of Toronto, Canada. London: Longmans, Green and Co. 1926. Pp. 357. 18s.

THE monograph under consideration deals mainly with the physiological aspect of insulin. Prof. Macleod sets out to prove that insulin is derived from the islets of Langerhans, and commences the monograph with a detailed account of the histology of the islets, and a very interesting summary of the comparative anatomy of these structures. This part of the text is illustrated with photomicrographs, some of which are very clear, but others are of rather doubtful value. For instance, it is difficult to imagine what Fig. 4 is meant to illustrate. Prof. Macleod points out that by far the greatest yield of insulin is obtained from the islets, and, although he refers to the observations of other investigators who have shown that insulin can also be obtained from the acinar tissues, he does not consider that this weakens his argument. There is no reference to the observations which describe the presence of insulin in the tissues of depancreatised dogs, nor to the discovery of insulin in large quantities in tissues other than the pancreas. These observations are very difficult to explain if the classical theory as to the action of insulin be adopted. It must, of course, be borne in mind that "no other organ or tissue can replace the pancreas as the source of this hormone in the animal body."

There is a very brief description of the main methods for the preparation of insulin, together with a short account of its chemical properties. Then follows a detailed account of the metabolism of the depancreatised dog treated by dietetic means and with insulin. This ground is very familiar, and many reports on the subject have been published, but it is interesting to read the views of one of the original investigators on the question, and these are summed up in one of the later chapters. The mechanism of the action of insulin is discussed at some length, but this subject is, of course, an unsatisfactory one, and up to the present no definite statement as to the action of insulin can be made. The final chapter deals with methods of assay, and consists mainly of a summary of the recent publications of the Standardisation Committee of the Health Section of the League of Nations.

This monograph is of great value in that it gives the general reader an opportunity of hearing the

views of one who has been associated with work on insulin from its beginning. The volume is certainly not a complete summary of the literature on this subject, as many important researches by European workers are omitted, yet, as Prof. Macleod states, "if undue weight may appear to be given to the work which has gone on under my own supervision, it is hoped that this will be pardoned on the ground that otherwise it would have been impossible for me to prepare the monograph."

DISORDERS OF NUTRITION AND GROWTH IN CHILDREN.

Clinique Médicale des Enfants: Troubles de la Nutrition et de la Croissance. By P. NOBÉCOURT, Professeur de Clinique Médicale des Enfants à la Faculté de Médecine de Paris. Paris: Masson et Cie. 1926. Pp. 404. Fr.36.

THE third volume of Prof. Nobécourt's notable system of children's diseases is on the same lines as its predecessors, detailed clinical accounts of individual patients being followed by a discussion of the conditions which they exemplify. This volume is perhaps the most attractive of the series.

The first part of the book is devoted mainly to the different types of hypotrophy in children; the cases described are illustrated by excellent photographs and by radiograms of the hand and carpus, the development of ossification centres being taken as one of the most useful points of distinction between the different types of retarded growth. The varying degrees of hypothyroidism, and the effect of syphilis in diminishing growth, are fully discussed in their relation to hypotrophy. The question of statural hypertrophy is approached in the same way, with special reference to the rôle of the endocrine organs. The author recognises three main types: the Hutinel type with delayed puberty and a subsequent stature not greatly in excess of the normal; acromegaly; and hypertrophy of stature with precocious puberty. The cases of obesity which Prof. Nobécourt describes are of remarkable interest, as is his discussion of the problem of their pathogenesis. He is convinced that many cases of obesity in children are wrongly attributed to diminution of pituitary secretion, and are of cerebral origin; when found in association with a pituitary tumour they are the result of neural lesions caused by pressure on the tuber cinereum or surrounding parts of the brain. This view is supported by evidence which he brings forward of obesity occurring as a sequela of encephalitis, also resulting from lesions of this locality. A few chapters are devoted to the clinical features and treatment of diabetes; some of these were written before and some after the introduction of insulin treatment. Non-diabetic acetonæmias are also discussed, and attention is drawn to the meningeal reaction which may accompany them, and the alterations which they produce in the cerebro-spinal fluid.

This volume further establishes Prof. Nobécourt's "Clinique Médicale" as one of the most important works on pædiatrics, and will give both pleasure and instruction to all who are interested in problems of growth and of endocrine function.

NEMATODE WORMS.

A Synopsis of the Families and Genera of Nematoda. By H. A. BAYLIS and R. DAUBNEY. London: Trustees of the British Museum. 1926. Pp. xxxvi. + 277. 10*s.* 6*d.*

ZOOLOGY is essentially a science of classification, and this is no less true for the more economic branches than for the purely scientific. Without classification we are unable to apply effectively our knowledge of biology and preventive measures, and although to the true biologist the name of an animal is merely a label, without a systematic knowledge of these names chaos would result. This is particularly true of the round worms, over 600 genera of which are described and classified in the present work. It is unfortunate that the authors have stopped at genera, as the absence of species considerably reduces the value of the book to the general zoologist and the medical man. A genus is often an artificial collection of species based on some arbitrarily chosen morphological detail; and while the authors on the whole have avoided the obvious pitfall they have often been compelled to write a diagnosis of a genus containing a single species—a task of great delicacy and sometimes questionable value, as such a species is often proposed on account of its differences from other genera rather than on its own intrinsic characters.

The classification of the "worms" has received a great amount of attention in recent years, but in most cases only the parasitic forms have been considered. Baylis and Daubney believe, however, that a more accurate system should include all nematodes, free-living or parasitic, without regard to their habitat. The adoption of this plan has in their hands led to some curious anomalies, although there can be no doubt that it gives a sense of perspective to the study of the purely parasitic forms, and a sense of perspective is a valuable adjunct in all the branches of economic biology.

As the last word has yet to be written on systematic helminthology, few students of the nematodes will agree with everything in this volume, but many will agree with most, and all will welcome the addition of such a concise synopsis to their library shelves.

PUBLIC HEALTH ENGINEERING.

The Principles of Public Health Engineering. By EARLE B. PHELPS, B.S., Professor of Sanitary Science, College of Physicians and Surgeons, Columbia University. New York: The Macmillan Company. 1925. Pp. 265. 12*s.* 6*d.*

THIS book, in spite of a title not particularly attractive to medical men, will be found to make interesting reading. It is intended for the health officer with little knowledge of engineering, and for the sanitary engineer whose understanding of the public health objective of his efforts is usually vague. The author, a chemical biologist who has become a sanitarian, is well equipped for his task. The scope of the work is limited to a few problems—viz., ventilation and atmospheric pollution, water-supplies, sewerage, pasteurisation, lighting, refuse disposal, and insect control. In each of these subjects the fundamental principles involved, and their application to the needs of society, are discussed in relation to modern scientific investigation and engineering practice. The treatment is perhaps more satisfactory on the scientific than on the practical side, but even practical issues are dealt with more thoroughly than is customary in the ordinary text-book on public health. Interest is enhanced by the exposition of the results of investigations by the author and other workers on sanitation in America, which compensate for the somewhat astonishing meagreness of the references to English and other European observers in a branch of medicine which we have been accustomed to regard as peculiarly our own.

This book should be read by every medical officer of health and teacher of hygiene, and it may also be recommended to civil engineers whose work brings them into contact with problems of sanitation.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains the following articles: The Effect on Renal Efficiency of Lowering the Blood Pressure in Cases of High Blood Pressure, by Charles Reid. Certain renal efficiency tests, such as the estimation of blood-urea and non-protein nitrogen and the urea-concentration test, were made upon patients suffering

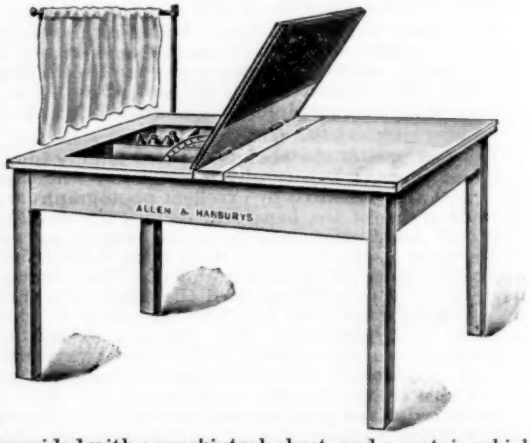
from increased blood pressure both with and without renal disease, before and after the application of measures designed to cause a temporary lowering of the blood pressure. The investigations were undertaken in order to determine whether the efficiency of the kidneys is affected by lowering hypertension in such cases. The results obtained showed that the blood-nitrogen figures are not raised as the result of the administration of vasodilator drugs for periods varying from 24 hours to over a week. There is, however, in such circumstances usually an increased urea concentration in the urine after the exhibition of urea by the mouth. A large fall in blood pressure following venesection in high pressure cases does not interfere with the excretion of urea.—A Critical Analysis of Certain Laboratory Methods Applied to the Cerebro-spinal Fluid in the Serological Diagnosis of Neuro-syphilis, by H. Ferguson Watson. An introductory account is given of the various laboratory tests applicable to the cerebro-spinal fluid in cases of neuro-syphilis, and of the results obtained by various workers. The author investigated a large series of cases, both syphilitic and non-syphilitic. In addition to a clinical examination the following tests were applied: the Wassermann reaction of the blood-serum and cerebro-spinal fluid, the colloidal gold test, the globulin tests, the cell count and the foam test. Out of 100 cases clinically syphilitic the Wassermann reaction was positive in the serum in 96, and in the fluid in 97. The gold test was positive in 89 of these, and the globulin test in 95. In the non-syphilitic cases the Wassermann test was negative in serum and fluid in every instance, but the Lange test was positive in 45 out of 103 cases, which included such diseases as influenza, acute rheumatism, mumps, and chronic nephritis. The author therefore concludes that the Lange test is quite unreliable in the diagnosis of neuro-syphilis.—Observations on the Gastric Acidity and Secretion in Health, by T. A. Butcher. A series of personal experiments were made to determine the effect of pyschic stimulation on gastric secretion, the secretory response of the stomach to various articles of food, and the estimation of pepsin secretion. It was found that difficulty in swallowing the tube causes a marked degree of hypo-acidity and gastric inertia. Pyschic stimuli, on the other hand, such as chewing biscuits or sausages without swallowing, or the smell of bacon and tomatoes being fried, causes a marked increase in the acidity, total chlorides, and ferment curve. Many interesting results were obtained on the effect of articles of food upon the gastric secretion, for details of which the article should be consulted. Thus olive oil was not found to cause a lowering of acidity, nor was there an increased regurgitation of bile. On the other hand, tea without milk was followed by results suggesting an inhibition of gastric secretion.

INDIAN JOURNAL OF MEDICAL RESEARCH. July, 1926.—Major A. H. Russell continues his exhaustive study of the epidemiology of cholera with illustrative tables. D. A. Turkhud and C. G. Pandit describe an epidemic of an alastrim-like disease in Madras with some experimental investigations upon the virus. Lieutenant-Colonel J. Cunningham and T. N. S. Raghavachari set out recent methods of differentiating lactose-fermenting organisms as applied to Indian conditions. A valuable contribution to the study of heat stroke is supplied by Colonel F. H. G. Hutchinson in Allahabad Brigade area. In the progress report on researches in sprue (1924–25) N. Hamilton Fairley, Lieut.-Colonel F. P. Mackie, and their associates have done much to clear the ground for further original work on this intricate subject. Major R. B. Lloyd and R. G. C. Mitra contribute a timely paper on the Wassermann reaction in malaria. Lieut.-Colonel S. R. Christophers and Major J. A. Sinton provide a malaria map of India. Asa C. Chandler surveys the prevalence and epidemiology of hookworm and other infections in India and records the probable discovery of a new schistosome.

New Inventions.

A DRESSING TABLE.

THE dressing table here illustrated is useful as a part of the equipment of a consulting or small casualty room. It consists in effect of a shallow rectangular box mounted in the form of a table. The table top is formed out of two broad pieces of wood, or better of metal, hinged on a central narrow strip. The interior of the box is divided up into compartments. In the left side are placed instruments, ligatures, local anæsthetics, a kidney dish, pure carbolic acid, lysol, ether soap and spirit, &c. In the right side are placed bandages, dressings, adhesive plaster, tr. benzoin, iodine, &c. The top of the left leaf of the table is



provided with a mackintosh sheet, and a curtain which is capable of being swung across the table. For example, a patient comes in with a cut hand. He is seated at the left end of the table, instruments are chosen and sterilised, and the leaf replaced. The patient places his hand on the table, and the curtain is swung across his view in order that he shall not see what is happening. When the operation is concluded the right leaf is raised, tr. benzoin co. or tr. iodine is dropped on the hand with a pipette (discarding the dirty method of using a brush for this purpose), and a dressing and bandage are applied. The special advantages claimed for the table are (1) its convenience, all instruments, dressings, &c., being directly visible; (2) the contents are kept free of dust; (3) increased comfort of the patient, as he does not see his injury: and (4) small cost.

Messrs. Allen and Hanburys, Ltd., are the manufacturers.

A. P. BERTWISTLE, M.B., Ch.B. Leeds,
F.R.C.S. Edin.

Reports and Analytical Records.

ANANA BRIGHTENING SHAMPOO JELLY.

(SEATON BURRIDGE, 4, WINDSOR-PLACE, CARDIFF.)

THIS preparation is used as a shampoo. It is claimed to promote the growth of the hair, to give faded hair a gloss, and to remove any greasy appearance. The jelly is green in colour and has an odour of verbena. When analysed the following results were obtained:—

Moisture	36·4	per cent.
Mineral matter	19·3	,, ,,
Fatty acids	41·5	,, ,,

The soap is alkaline, due to the presence of potassium carbonate. No free caustic alkali was detected. Borax also was found. The colouring matter is chlorophyll. The jelly forms a good lather.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 11, 1926.

SURVEY OF THE PUBLIC HEALTH.

SIR GEORGE NEWMAN'S report to the Minister of Health [1] follows hard on that of his fellow Secretary, Sir ARTHUR ROBINSON,[2] and while the statesman may be regarded as keeping his finger on the pulse of the community in its reaction to the Public Health and Insurance Acts, the chief medical officer possesses an instrument more in the nature of an electrocardiograph on which are recorded the delicate responses of the body corporate to physical influences, and in which the difficulty lies not so much in record as in interpretation. With that in mind the chief medical officer has been at pains to bring into being a section of the Ministry to deal with statistical intelligence, a phrase which, although of horrid aspect, lies deep in the foundation of effective public health administration. It has been Sir GEORGE NEWMAN'S object to provide a section which, neither overburdened with pure routine however essential, nor devoted to research work however interesting, should follow a middle path, educating itself and others in the use of medical statistics, and particularly in the use of official data of our own and other countries. All through his report the chief medical officer shows a reluctance to associate effect and cause where a variety of interpretations are possible and a restraint in ascribing praise or blame to particular agencies or objects. Nevertheless, there are passages in which he lets himself go in the one direction or in the other, as, for instance, in regard to the unrestricted spread of small-pox in several sanitary districts owing to neglect of well-known precautions. An ill-administered district, he writes curtly, is a constant source of menace to its neighbours and to the country as a whole. It acts as a reservoir from which an infection is liable to be carried to hitherto uninvaded areas. And on the other hand, while admitting that data are as yet insufficient fully to assess the value of infant welfare centres, he gaily fills a page of the report with letters from tram-conductors, printers' clerks, foster-mothers, and others who have appreciated these centres and have written to say so.

At the end of the report Sir GEORGE NEWMAN sets out the principal evidence concerning the physical life and health of the people of England and Wales during the year 1925, showing, in brief, a birth-rate of 18·3 per 1000—the lowest on record except for the war years of 1917–18; a death-rate of 12·2 per 1000—the same as for 1924, with an incidence of 39 per cent. of deaths on persons under the age of 50 years; an infant mortality rate of 75—the same as last year. Notifications of infectious disease number round about 400,000, an immaterial change on last year. The chief causes of death stand on the same numerical relation to each other as before, circulatory disease claiming 177 of each 1000 deaths, respiratory diseases 165, cancer 110, nervous diseases 99, and tuberculosis 85, and Sir GEORGE NEWMAN'S outlook does not allow him to state in so many words that these five diseases are the chief physical enemies of the country at the present time. Disease, he states—and it is well worth while to reiterate it whenever possible in some new and striking form—is the reaction of the human body to irregularities of its whole environment, including various forms of infection. The chief enemies are not the end-results but the earlier conditions which produce them, and only the study of these will show directions in which effort is likely to succeed. On tuberculosis the present line of attack is to reduce the chances of infection and strengthen the bodily resistance; cancer is to be held at bay by early detection which allows of removal or reduction of the new growth; any attempt to limit heart disease without differentiation of its causes is futile. The mortality from respiratory disease leads to one of the chief medical officer's more dogmatic utterances. Evidently, he writes, pneumonia is to a large extent a preventable disease, and the North of England has still much to learn with regard to its prevention.

The medical staff which collates the materials on which Sir GEORGE NEWMAN'S survey is based consists of six sections, each with its senior officer in charge. Sir GEORGE BUCHANAN presides over the Section of General Health and Epidemiology, Dame JANET CAMPBELL over that of Maternity and Child Welfare, Dr. F. J. H. COUTTS over that of Tuberculosis and Venereal Disease, Dr. A. W. J. MACFADDEN over the Supervision of Food Supplies, Dr. J. SMITH WHITAKER over the General Practitioner Services, and Dr. H. A. MACEWEN over Sanitary Administration in Relation to Infectious Disease. Of the 15 full-time medical officers in Section I. three direct the Pathological Laboratory. Section II has four medical officers, all women, as well as women inspectors. Section III has 7 full-time officers and commands the part-time services of Colonel L. W. HARRISON. Section IV includes 3 medical officers, a chemist, and 2 milk inspectors. Section V has 4 full-time medical officers and a large regional staff distributed over the country. Section VI in addition to its 9 medical officers has 2 officers attached to the Government Lymph Establishment. The Welsh Board of Health constitutes a seventh section with Dr. D. LLEWELYN WILLIAMS as senior medical officer. The field work of several sections is, of course, done by the medical officers of health with whose problems the report sympathetically deals, especially in relation to the division of responsibility in non-county areas between the supervision of environment and the oversight of personal hygiene; in Sections II and III by the clinical officers attached to the public health services; and in Section V by the practitioners whose names appear on the medical lists of insurance committees. These in their turn draw upon the ever-widening group of ancillary colleagues—dentists, midwives, nurses, health visitors, sanitarians, engineers and the rest. Coöperation on the part of this great community has produced the report presented by the chief medical officer of the Ministry, and that report is a practical testimony to the way the machine works and to the practical results.

[1] On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1925. H.M. Stationery Office. 1926. 5*s*.

[2] Seventh Annual Report of the Ministry of Health, 1925–26. Cmd. 2724. H.M. Stationery Office. 3*s*. 6*d*.

REACTION TO BLOOD TRANSFUSION.

FOR several years experiment and observation have been directed towards the elucidation of the cause of the so-called minor reactions which often follow transfusion of blood. A variety of causes have been held responsible, such as sodium citrate, the use of rubber tubes, a fall in the temperature of the blood injected, and so forth. None of these has quite

carried conviction with those who practise transfusion, and it is of interest to note that some new observations published this year seem to come nearer the mark than any that have gone before. The first of these is an article [1] by Dr. CHARLES A. DOAN on the Recognition of a Biologic Differentiation in the White Blood Cells. This author observes very justly that there are too many factors entering into every transfusion for it to be possible to give to any one of them the full responsibility for the reactions. He claims, however, to have demonstrated that, in addition to the well-known incompatibilities between the serum and red cells of different individuals, there is a similar and definite incompatibility between the serums and the white cells. A biologic classification according to groups has not yet been achieved as there seems to be a large number of possible combinations, but it was estimated that about 40 per cent. of the individuals investigated were "universal donors" as regards their white cells; these were, of course, not necessarily the same individuals as belong to the red cell group IV. of Moss. Dr. DOAN suggests that before transfusion the white cells of donor and recipient should be directly matched as well as the red cells. He believes that the destruction of white cells goes on gradually as the blood is transfused until enough foreign protein has been liberated in the patient's circulation to produce a reaction. This might explain the fact that the reaction usually occurs about half an hour after the transfusion is completed. A contribution of a different kind comes from Dr. ROBY JONES and Prof. E. E. GLYNN, of Liverpool University.[2] These authors have made an elaborate investigation of the red cell blood groups of 40 healthy individuals by cross-agglutination and by absorption tests, each agglutination being done in five dilutions. The tests were very delicate and revealed seven abnormal donors among the 40 investigated. All these seven agglutinated with another member of their own group, and three of them belonged to group IV. The authors suggest that these results may indicate the existence of abnormal blood groups, and may explain some of the unexpected clinical symptoms after transfusion. Another step forward is recorded by Dr. F. W. SIMSON, of Sheffield University.[3] He has directed his attention to the isolation of a third pair of agglutinating factors in human blood in addition to the two pairs constituting the four groups of Moss and Jansky. Other observers have already claimed to have demonstrated this. Dr. SIMSON now confirms their observations and finds that the presence of the third system can be readily demonstrated by absorbing a group III. serum of a particular type with a group II. serum, and testing with the resulting serum. He finds that the third system is present in a large percentage of human bloods, but is not detected by the ordinary methods of testing. He finds further that the system designated in the Jansky-Moss classification by the letter A is occasionally suppressed. The blood of an individual in whom the A system is absent will appear to belong to group IV. (Moss), although his blood is actually incompatible with other members of group IV. Fortunately such individuals are rare, but the discovery goes to prove that the term "universal donor" for members of group IV. is a misnomer, as some authorities have always maintained. Whether we have to deal with abnormal groups, or rather, as now seems likely, with additional normal groups, it becomes more desirable than ever that a cross-agglutination test between donor and recipient should be done wherever possible, and that every transfusion should be conducted very slowly at the beginning so that an unexpected reaction can be detected before serious harm has been done.

[1] Charles A. Doan: Jour. of Amer. Med. Assoc., May, 1926.
[2] A. Roby Jones and Ernest E. Glynn: Jour. of Path. and Bact., 1926, xxix., 203.
[3] F. W. Simson: Ibid., July, 1926, xxix., 279.

INTERNATIONALISM IN PORT SANITARY WORK.

THE Fourth International Sanitary Conference has been recently held at Paris, when 70 nations were represented, including, as separate signatories, the dominions of Canada, Australia, and South Africa and British India. The Conference had the duty of bringing up to date and revising the International Sanitary Convention under which the various signatory Governments in 1912 agreed on mutual action and common standards for dealing with the chief diseases liable to be carried by shipping, among which the pestilences of cholera and plague have far the greatest significance. The Conference was a success, and has laid down new lines of international action of the first interest for those concerned in the health regulations of our ports, a matter which affects not only the whole of this country but, by reflection, all other shipping centres and the nations on whose lines of world communication these centres are. The apparently complicated organisation through which mutual action is now set up between civilised Governments for the prevention of epidemic invasion is, it would seem, working thoroughly well. The delegates at the International Conference influence and revise the procedures upon which the various Governments act at the instance of the International Convention, while the information forthcoming at the half-yearly meetings of the Office Internationale d'Hygiène Publique, sitting permanently in Paris, is on the one hand available for the Convention, and on the other for the League of Nations; for the Office Internationale now acts as an advisory council to the health organisation of the League, which is therefore in a position to assist all port sanitary work. The enormous potentialities of the League of Nations in regard to the maintenance of the health of the world should be ever present to our minds; patriotic jealousies may be inherent in the development of the League, but a really international affair like the health of the world must not be impeded by racial sparring. And recollection of this is timely while the League is in session.

Before the Royal Sanitary Institute at the recent jubilee meeting Sir GEORGE BUCHANAN opened a discussion upon the present position of international agreements as they affect port sanitary work and the International Sanitary Convention, and throughout the address he considered the position of plague, its incidence and carriage, in illustration of the progressive work now undertaken by the representative sanitary authorities of the world. The great plague epidemic, which began in China over 30 years ago and extended almost immediately to Bombay, thereafter to gain a permanent footing in India, imposed on port authorities a revision of their administrative machinery and a search for all the scientific resources which they could command. Thus, in face of a new set of problems, epidemiologists and bacteriologists have supplied an increasing range of pertinent knowledge. The result has been that we now know that plague infection, when carried by ships, cannot be dealt with in the same way as the infection of cholera, and further, that not only will international codes require variation in respect of different

diseases, but that a particular disease, plague for example, cannot be fought with identical methods at all centres. The old and cruel preventive system, recalled in the word "quarantaine," has long been superseded, owing, we may be proud to think, to the resolute opposition of British sanitarians, but the humane and scientific methods which succeeded have required regular modification with the growth of knowledge. It is not enough to examine passengers and crews from infected areas, or to provide isolation and surveillance for sick people and contacts, nor is it permissible to await the occurrence of human plague on a ship before taking measures for the destruction of rats; as rats became recognised as the essential villains of the story, preventive precautions had to be altered in direction. "Port sanitary authorities all over the world, though for different reasons and in different circumstances," said Sir GEORGE BUCHANAN, "have direct interest in the suppression of rat plague on ships, in preventing the access of rats from ship to shore, and in keeping down the rat population in wharves, docks, and warehouses." This much is common knowledge, and we may assume all those interested to have read the useful publications of the Ministry of Health on the subject. Those who on account of their particular avocation are compelled to study port sanitation, are familiar with the different methods employed in fighting rats on ship or shore, and on their intermediate passage. But it may easily happen that early steps have to be taken by those whose immediate work is not of a sanitary nature. Both in South Africa and Australia this is recognised, and quite recently in Australia the Commonwealth Department of Public Health has brought out a handbook for the guidance of customs officers which contains an outline scheme for dealing with an outbreak of plague in a port in a practical manner. The rat is a doughty foe, and it is largely on account of his irrepressibility that the Australian handbook considers it necessary to go into minute details of staff, office accommodation, and even the number of telephones that may be needed to repress a sudden invasion of plague. The public may guess how much the world's immunity from pestilence is due to the great organisations outlined above; but Conferences and Conventions would be futile without the devoted attention of individual port officers, and this is a thing which deserves grateful attention.

While recent developments against the attacks of plague, including various methods of rat destruction, are valuable, they none the less bring with them certain difficulties which have to be considered from an international aspect, and the arguments for thinking internationally in regard to plague, and even in regard to one side of the prevention of plague, could—mutatis mutandis—be applied to the whole range of epidemiology. If every country in the world applied the full force of its quarantine or port sanitary service, and all its experience, to prevent every possibility of the inter-carriage of infections, regardless of what was being done or had been done in this respect by any other country, there would be such an overlapping of inspections that the business of the world would be seriously hindered. These are the difficulties which the International Sanitary Convention exists to take into account, adjust, and minimise, and the regular revision of the Convention's regulations should keep pace with the world's progressive accumulation of scientific wisdom. The dissemination of news by wire and air will have beneficial results exactly as the machinery exists for prompt action upon information.

Annotations.

"Ne quid nimis."

HOSPITALISATION OF THE ASYLUM SYSTEM.

WHEN the future historian surveys the treatment of mental disorder he will probably divide its development into three age-periods. The first will be that in which the mentally afflicted person was regarded as a criminal and the second that in which he was regarded as a wild animal. The first quarter of the twentieth century has marked the transition from the second to the third stage, in which he is being regarded more and more as a sick man. In the era just passed the patient of mental disorder was not far from being in the position of a wild animal housed in a humane zoological gardens; his physical necessities were provided, with such additional comforts as charity or private means could procure, and he was firmly enclosed in a safe cage lest he molest the remainder of mankind. If by a happy chance he struggled back to a standard of conduct compatible with civilised life, he was released from his cage and a veil of scandalised silence was drawn over his past, as far as possible, that is, for society never dreamed of admitting a comparison between a disordered brain and a disordered stomach, or of looking on an attack of mania in the same light as an attack of diarrhœa and vomiting.

The progress made in right thinking on these matters in the last 20 years has been remarkable, and it is of the highest importance that the success already achieved should be followed up. It may be that the stress of war and the steadily increasing strain of modern life has quickened our sympathy and our intuitive understanding of the mental state of those who have just failed to keep pace with the stream. Now that the majority of people only maintain their headway with difficulty, they are able to realise that the "insane" patient is not of a different genus, a thing strange and abhorred, but of like nature with themselves, reacting as they would react if the screw were turned a little tighter. The great obstacle in the way of those who have the peculiar training and ability to translate this understanding into active help is that, once beyond a certain point, the lines of communication are broken, and in the present state of our knowledge it seems impossible to get any message through to the beleagured garrison of a psychotic mind. The physician can only stand outside, ever on the watch, and give what relief he can by setting disordered bodily processes at rest. But before this stage is reached there is invariably a prodromal period when much can be done, and the most tragic reminder of the "wild animal" era that we have still to face is the fact that this critical time is one when the help and the need are usually separated by a gulf of tradition and false thinking. Relatives and patients alike refuse either to acknowledge or to take seriously the first symptoms of mental disharmony. It is also unfortunately true that the average practitioner is still untrained in the treatment of such cases and that both he and the public shrink from the mental specialist and send for him only when the time for helping is past. Much responsibility, in this as in all departments of public health, lies on the general practitioner, and if the harvest of the psychiatric revolution is to be garnered successfully some means must be found of bridging the educational gap between the neurological out-patient department and the hurried course in the wards of a mental hospital.

The annual report of the Board of Control[1] shows this year again how strenuous are the efforts of the statutory authority to ensure the adequate advance of psychiatry. One of the measures to this end is the provision of centres for out-patient treatment. The Commissioners remark that they are "satisfied that such centres are productive of very great good,

[1] The Twelfth Annual Report of the Board of Control for the Year 1925. H.M. Stationery Office. 1926. Pp. 468. 12s. 6d.

and that, in the public interest, it is important that they should be extended." Unfortunately, it is still only in a comparatively few areas that the work, first commenced in the West Riding of Yorkshire, is being extended. Its value is inestimable, and, unfortunately, it is much restricted in many places by the fact that no special beds are available and that the institutions are not yet allowed to admit their out-patients as voluntary boarders. It is most discouraging to read that certain local authorities still refuse to admit uncertified patients because of the loss of the small grant which they receive for those legally classed as "lunatics." Such a grant interpreted in such a way puts a premium on incurable mental disorder. The social conscience of the public should not be satisfied until every mental hospital receives voluntary patients; only in this way will the number of certifiable cases be reduced and the percentage of cures raised. Although "asylum fear" is greatly reduced by attendance at such out-patient departments, the Commissioners recognise its deterrent effects and encourage mutual arrangements wherever possible between general and mental hospitals. In this way the resident staff of the latter can attend the general hospital as out-patient physicians. In every revolution some valuable feature of the old system is overthrown, and it is permissible to regret the arrangements of the eighteenth and early nineteenth centuries whereby rooms were set aside in most general hospitals for insane patients. To make room for the steadily increasing number of people who are willing to enter a mental institution before their trouble is incurable, some way must be found of extending the accommodation, which is seriously overcrowded in most parts of the country. The modern mental hospital is a highly equipped institution, and is too elaborate an instrument to be used for harmless senile patients, for whom nothing curative can be done and who need only that the way to death should be made smooth and peaceful. An approach has already been made to certain boards of guardians with a view to housing these old people in the Poor-law institutions, and the Board of Control desires that such arrangements should become general. The great problem raised by the measure is the education of infirmary nurses in the proper care of these none too easy patients.

There are many other respects in which the up-to-date mental hospital is rapidly becoming a microcosm of modern treatment. No such institution is complete without a visiting dental surgeon, and the Commissioners urge the appointment of a consultant in each of the specialties. Whatever the cause of mental disease may be, hidden septic foci, disordered metabolic processes, and faults of the special senses can but prolong the struggle for equilibrium; 30 per cent. of the mental hospitals are without a properly equipped pathological laboratory and trained pathologist, and the Board believe that these are essential from the point of view both of patients and staff. They also feel strongly the need for an X ray installation and a radiologist, noting certain instances in which the elucidation of symptoms has been either impossible or detrimentally delayed by the absence of X ray facilities. Clinical rooms for simple investigations, note-taking, and informal and therapeutic conversations are necessary for the proper conduct of cases and are being provided in most of the hospitals. One of the most striking and valuable features in the hospitalisation of the asylum is the granting of parole and "trial trips" before discharge. The mental condition of responsible people who are in psychological conflict is undoubtedly made worse by locked doors, censored correspondence, and all the relics of the prison system. No harm has resulted from the judicious use of open-door wards and verandahs, freedom of action within the grounds, and provisions of tobacco and small comforts. Many a superintendent has blessed the new system which enables him to send a recovered patient out with sufficient money to tide him over the first difficult weeks of readjustment, when the added problem of financial stress would almost certainly mean another breakdown.

BENZOL POISONING AS AN INDUSTRIAL HAZARD.

COMMERCIAL benzol is a coal-tar distillation product of which the chief constituent is benzene, C_6H_6. It is coming more and more into industrial use as a solvent for rubber, gums, fats, and resins, as a starting-point in the manufacture of coal-tar products and chemicals, and as a motor fuel blended with petrol. Its toxic properties were first recognised after a coroner's inquest in 1862,[1] and steps have since been taken to control the risk which exists in its manufacture and use. A committee in America has been studying the position since 1922, and now three articles summarising their work have appeared.[2] In the manufacture of benzol, the blending of motor spirit, and the chemical industries, the hazard is so great that stringent precautions are taken and mishaps only occur due to their breakdown; but when benzol is used as a solvent, at any rate in the States, in the rubber industry, artificial leather-making, sanitary can manufacture, dry cleaning, or in manipulating paints and varnishes, danger from inhaling benzol vapour is considerable. A résumé is given of all known acute cases which have usually occurred through accidental exposure to vapour in closed spaces, such as coal-tar stills, benzol holders, or when painting the inside of tanks. The vapour of benzol is heavier than, and so displaces, air. A worker feels headache and dizziness and may then sink into the trough of vapour to be asphyxiated. Only rapid removal into fresh air can save life, but many unprotected rescuers have failed in their efforts and have themselves been overcome. Acute cases are either rapidly fatal or respond quickly to treatment; but there may be after-effects. Air containing 0·5 per cent. will produce confusion within half an hour, and from 0·6 to 0·9 per cent. poisoning within a few hours. Acute cases are, however, rare compared with chronic cases due to inhaling low concentrations over prolonged periods which have occurred in applying rubber dissolved in benzol to tin cans, in spreading rubber cement, and in rubber-tyre building. Details of several cases are given. Young girls exhibit a marked susceptibility. Serious results ensue from prolonged exposure to air containing 0·2 per cent. of benzol vapour. The usual symptoms are headache, dizziness, palpitation, bleeding gums, frequent menstruation, and blue spots on the arms and legs, with secondary anæmia, the leucocyte-lymphocyte formula being inverted. Nervous symptoms indicating sclerosis of the dorsal columns and pyramidal tracts follow. Leucopenia may be severe, and the red cell count be below 500,000, with hæmoglobin as low as 15 per cent. Animal experiments, for the most part confirmatory of observations on human beings, carried out by many workers, are summarised; they bring out that resistance to microbic infections is diminished by benzol poisoning. An effort, confessedly incomplete, was made to ascertain the extent of the benzol hazard in the United States through a questionnaire sent to firms likely to be concerned. By this means 15 fatalities and 83 cases of sickness were traced previous to 1925; 29 compensable cases in the State of Ohio in five years; and seven fatalities during the first nine months of 1925. Next the committee undertook an intensive study under factory conditions of atmospheric pollution by benzol. The method of testing employed was to absorb any benzol vapour present in activated charcoal, and a description is given of the apparatus used. Concentrations of solvent vapours were detected varying from 40 parts to 4140 parts per million of air. The blood of 81 persons employed in the atmospheres sampled was examined, and in 26 cases the findings were positive for benzol absorption; the standard chosen was a white cell count of less than 5500 per c.mm. Histories are given in detail of two cases which justified

[1] THE LANCET, 1862, i., 105.

[2] Benzol Poisoning as an Industrial Hazard. By L. Greenburg. Public Health Reports, Vol. xli., No. 27, pp. 1357–1375, No. 28, pp. 1410–1431, and No. 30, pp. 1516–1539. 1926. Washington: Government Printing Office.

the diagnosis of aplastic anæmia. Undoubtedly as benzol is used to-day it involves a substantial industrial hazard. Even when the concentration is below 100 parts per million all risk is not avoided owing to the great personal idiosyncrasy of some individuals. The use of substitute solvents of less toxicity is the only sure remedy. Meanwhile exposure to risk should be minimised by preventing benzol vapour from escaping into work places or by withdrawing it at its point of origin. And steps should be taken to detect incipient cases of poisoning and withdraw them from risk; standards of initial health before employment, and of symptoms calling for suspension, are proposed. The full study made by the committee is to be published later, but the present preliminary articles exhibit benzol as an insidious industrial hazard. The bibliography attached to the third article indicates how widespread is this hazard.

THE TREATMENT OF PSORIASIS.

IT is the experience of most British dermatologists that the treatment of psoriasis by injections is, as a rule, ineffective unless supplemented by vigorous local measures. This opinion was emphasised by Dr. R. McKenna in his opening address to the discussion on the treatment of psoriasis, which we report on p. 550. Neither he nor those who followed him appear to have made a trial of tartro-bismuthic salts which Dr. A. Versari,[1] of Naples, claims to have used with some degree of success. Sabouraud's conception that the modern treatment of psoriasis should be directed to the discovery of some substance that, under the form of injections, is capable of influencing the lesions without recourse to local applications, has lately been applied by Dr. Versari. It has long been believed that psoriasis is sometimes favourably influenced by injections of grey oil, enesol, and arsenobenzol even in the absence of signs of syphilis, and that salts of bismuth have a definite spirochæticide action, as shown by Levaditi and Castellani in the spirochætosis of rabbits and fowls. Prowazec and Rasck, of Christiania, claim to have isolated a similar organism which they name *Spirochæta sporogona psoriasis*. These researches influenced Dr. Versari in experimenting with an organic preparation commercially known as *Trepol*, which is an oily suspension of tartro-bismuthate of soda and potash containing 60 per cent. of bismuth. Intramuscular injections every five to six days in doses of 2–3 c.cm. were given in 21 cases; they were well tolerated, no stomatitis or renal trouble occurring, and the gingival rim formed very slowly and never reached the intensity noticed in syphilitics treated with bismuth. Out of the 21 cases under observation, no local treatment being given, a complete retrogression of the lesions took place in 12; in the other nine there was partial regression, desquamation, and diminution of the hyperæmia. All the patients had relapses but always in a much smaller degree, except one who had no relapse from November, 1924, till January, 1926, not having been given any injections since June, 1925. In three patients a psoriasic leucoderma appeared after the cessation of the lesions. Histological examination of these patches showed (1) depigmentation of the epidermis from disappearance of the epithelial chromatophores and marked scarcity of the connecting filaments; (2) persistence of the granular layer; (3) slight increase in the superficial layers without parakeratosis; and (4) hypertrophy of the collagen fibres in the deep portion of the reticular part of the corium. Researches made on smears from the lesions failed to discover the *Spirochæta sporogona psoriasis*, but linear or spirilliform bodies were seen coloured violet-red by Giemsa, sometimes isolated but more often in masses. They were regarded as probably connective tissue fibres or macerated elastic tissue. In the absence of any positive evidence of the presence of an organism the action of the bismuth injections cannot be explained as spirochæticidal, and investigations directed to detect the presence of bismuth in the retrograde patches of psoriasis were without result. Dr. Versari is inclined to agree with Sabouraud's opinion that the various injections which have been used with success in the treatment of psoriasis, such as calomel, enesol, cacodylate of soda, camphorated oil, antitetanic and antidiphtheritic serum, simple horse serum, Danysz's entero-vaccine, including preparations of bismuth, may be considered as working by shock production. Most of his colleagues in this country will agree with this view, but it does not follow that certain of these preparations are not more effective than others in producing shock of the right kind or degree.

[1] La Riforma Medica, May 3rd, 1926.

THE TWO GIBRALTAR SKULLS.

THE Abbé Breuil, some years ago, noticed and called attention to Mousterian remains in the neighbourhood of the Devil's Tower at Gibraltar, and a result of his observations was seen at the recent meeting of the British Association at Oxford, when Miss D. A. E. Garrod described the fruits of her excavations in this place. Among other things, a young human cranium was found, embedded in hard travertine, under conditions which make it practically certain that its original owner belonged to the period represented by its immediate surroundings and accompaniments. Mr. L. H. Dudley Buxton seems to have been very successful in freeing the specimen from its matrix, and has already advanced tentative reconstructions and suggestions based on his work: it is, of course, too early to do more in this place than record the discovery, as the remains will have to undergo a lengthy and exhaustive examination before definite announcements can be made about the cranium, which is that of a child. This skull, referred to in the lay press as the "Gibraltar skull," is not really entitled to this name as a distinctive label, for many years ago another discovery was made close to the site of the present one. This original find, the "Gibraltar skull" of anthropologists up to the present, was found in 1846 in the Forbes Quarry. Its present-day value was not assigned to it for many years, however, and the uncertainty about its date is still a stumbling-block in the way of definite recognition by many, although it is now generally admitted to be of great age. It has been considered a female relic. While Gibraltar I. is thus still doubtful in some ways, and hence stands somewhat in the background at present, the cranium now brought forward, Gibraltar II., is undoubtedly authentic as a Mousterian relic, presumably from one of the Neanderthal race. *Homo neanderthalensis* was a human being of a low order, whose known anatomical remains are now sufficient in number to allow of more or less clear ideas of his characteristics, and distribution, to be formed. His kind inhabited the old world, at least through several epochs, and apparently died out after the end of the glacial period. Although no doubt a very unpleasant fellow according to modern standards, he was not a wild beast, but possessed a large brain and had a culture of his own; this improved as the ages went on, and it is customary to recognise different types of it, Chellean, Acheulian, and Mousterian, these names being given with reference to certain places where typical and undoubted examples have been demonstrated. The Mousterian is the last of these types, and covers the last glacial period. Neanderthal man overlapped higher cultures and human types, but whether he mixed with these and bred with them, or whether he lived and died apart as a separate species or a lower race, is not apparent. He is not generally looked on as in the direct line of ascent of modern man, but he is none the less a most fascinating study and problem, and everything which makes for further acquaintance with his form or his family, or his haunts and history, is of great interest. Gibraltar II. is not the only specimen of a young form that has been obtained, for remains of children were found at Ferrassie and at La Quina, while the

skull of a youth at about the age of puberty was among the discoveries at Le Moustier: this last was remarkable in the great development already of the heavy skull and brow-ridges which are characteristic of the race. When the latest addition is ready for complete examination it will without doubt provide many features of interest, both with reference to questions affecting its geological contemporaries and for purposes of comparison with other and more modern young skulls. Sir Arthur Keith describes it as the first representative Mousterian skull of a male child, and puts its age as between 20,000 and 40,000 years.

FEAR REACTIONS IN THE CHILD.

AN episode that recurs in almost stereotyped form was described last week at an inquest upon a child who fell into the *Mersey* whilst at play with three others, who were too frightened to tell anyone. Accidents are inevitable as long as rivers and children are in proximity, but such behaviour as the companions of the victim showed is not inevitable; yet it occurs with sufficient frequency to make us suspect that the cause is to be found in general principles rather than in individual tendencies. In our last issue we commented upon a parallel case in which a coroner severly condemned a lad of 15 who had hidden the fact of a playmate having been shot in the palm. The Warrington coroner adopted a different attitude in trying to lessen the remorse shown by the boys concerned in the drowning accident, and when we consider the impression that a fatal disaster can make upon adult participants we must agree that in such cases no words are wasted that can alleviate self-reproach in a child. We might, nevertheless, differ from the coroner's view that the three were silent because "you can't put old heads on young shoulders" and "boys of their age have not been trained to think and do what was the right moral thing to do." They knew as well as any adult what was the right thing to do, but were prevented from doing it by fear, and it is fear that leads to such incidents. Apart from knowledge, the instinct of the child is surely to turn to the adult for help; the secretive behaviour we are discussing indicates an inhibition rather than a lack of knowledge or moral training, and its causes are to be sought in our attitude towards the child. Perhaps we may reach an understanding of the mind of the child in such circumstances when we remember what care we take to avoid any censure upon sufferers from venereal disease lest that may lead them to hide it. If such care is necessary between man and man, we must recognise the need for avoiding the introduction of fear into the relation between the child and the omnipotent grown-up. Besides its influence upon behaviour, this fear is shown by modern research to underlie many nervous symptoms both in children and those of mature years—playing, indeed, a part greater than that played by actual terrifying incidents.

SANATORIUM TREATMENT OF TUBERCULOSIS.

THE efficacy of sanatoria in the treatment of tuberculosis has been questioned a good deal in recent times, and a number of attempts have been made to measure the results which they have obtained and are obtaining. The question is very complicated and it is difficult to get a certain answer. The latest contribution, by Dr. Percy Stocks and Mr. M. N. Karn, is published from Prof. Karl Pearson's laboratory in his *Annals of Eugenics* (vol. i., 1926, p. 407), and their inquiry appears to have been made with unusual care and thoroughness. They deal with the histories, over a period of six years, of 2794 consecutive cases of undoubted pulmonary tuberculosis brought under the survey of the Belfast tuberculosis dispensaries from 1914 onwards. Of these rather more than one quarter went to sanatoria, while the rest received only dispensary or domiciliary treatment. These two groups are compared with one another as regards death, general progress and condition after six years and each is divided into three categories of severity of disease when first seen as judged by a combination of anatomical and symptomatic data. For a discussion of the various pitfalls and uncertainties with which such an investigation is surrounded the original memoir must be consulted. But the authors reach without hesitation the summary conclusion that the ultimate progress of patients first seen in the incipient stage was worse in those who went to sanatoria than in those who did not; in those in the "moderately advanced" and "far advanced" categories the progress of the two groups was the same. These conclusions hold good for both sexes, and for young people as well as adults. The obvious criticism is that some sort of selection was exercised in choosing cases for sanatorium treatment which was related in some way to prognosis. The authors devote much attention to this point and, after examining all the circumstances which they can think might have any such influence, they conclude that if selection was made on any significant basis they cannot discover what it is. Many people will be loth to be persuaded off-hand that sanatorium treatment does phthisical patients no good, and it is in no depreciatory spirit of the careful work of Dr. Stocks and Mr. Karn that we suggest that it would be well if other statistics were similarly and independently examined in the light of their methods and commentary, including their suggestion that it is the depressing mental atmosphere of sanatoria which does the harm. It may be that there is some particular type of person who does badly under sanatorium conditions; the identification and exclusion of these might perhaps change the mass statistics to the more favourable complexion which most people believe, perhaps groundlessly, that they ought to have. Meanwhile it is well to remember that sanatoria exist for at least three purposes: to ameliorate the physical state of the individual patient, to teach him how to manage his life successfully after he leaves the institution and to spread this information by his example, and to protect others from infection. The present criticism deals only with the first of these objects.

THE MENACE OF OBESITY.

WE alluded last week (p. 508) to the diminished expectation of life for those in whom the circumference of the abdomen exceeds that of the chest. Investigations carried out on a large scale in America have shown that the optimum weight for a man of 45 years is about 20 lb less than the accepted average weight for that age, using the term "optimum" in relationship to physical fitness from the standpoint of an insurance company. The steady decline in physical efficiency which the carrying of 20 lb. of superfluous matter entails should in itself be sufficient antidote to the dangerous self-complaisance with which the middle-aged man views an increase in his girth If this is not enough, a perusal of Dr. Leonard Williams's new book on Obesity[1] will quickly frighten him into a more satisfactory frame of mind. The infiltration of fat into the subcutaneous tissues may result in a raised blood pressure from increased peripheral resistance, and against this high blood pressure a heart embarrassed both on its surface and throughout its musculature has to work under diminished efficiency. Renal disease is extremely likely to follow such a condition of affairs, and it is not surprising to learn that the mortality from cardiac and renal diseases among the obese is twice as high as in persons of normal weight. To make matters worse, it is notorious that such a diseased heart may give rise to very little in the way of symptoms and nothing in the way of local physical signs, and yet, as Dr. Williams emphasises, the fat man may die the next time he hurries to catch a train. Obesity does not stop at producing disturbances of the circulatory apparatus. The respiratory system may suffer, and it is well known that certain asthmatics may be

[1] Obesity. By Leonard Williams, M.D. London: Humphrey Milford, Oxford University Press. 1926. Pp. 171. 10*s*. 6*d*.

greatly relieved by cutting down their weight. Various troublesome forms of dyspepsia may result from over-weight, while invasion of the liver increases such troubles and the pancreas itself may suffer, leading probably to the form of diabetes associated with obesity. Intertrigo, varicose veins, hernia, and even deafness are some of the minor disturbances for which obesity may be blamed, to say nothing of the increased gravity of the prognosis of acute diseases in the obese subject. The cure of obesity is largely bound up with the problem of its causation. Perhaps the most striking advance on the subject within recent times has been the proved complicity of the endocrines leading to the broad classification of obesity into that caused by alimentary surfeit and that caused by underaction of one or more endocrine glands. The famous Daniel Lambert, who died at the age of 40 weighing nearly 53 stone, may safely be put into the latter category; but it is admitted that most of the obesity commonly seen about middle age is due to over-feeding. "To the scientist," wrote Vance Thompson, "there is nothing so tragic on earth as the sight of a fat man eating a potato." This quotation from Dr. Williams's book may give perhaps the keynote to the solution of the problem. It is not generally realised that it is the starchy carbohydrate foods rather than the more quickly and readily metabolised fats which are responsible for much of the alimentary type of obesity. More rational diet will go a long way to preventing this troublesome complaint, and in its cure this notion must be firmly established in the mind of the patient. The arguments for and against muscular exercise (which may actually lead to an increase in weight, especially in endocrine cases), rest in bed, fasting, the use of thyroid extract and special diets, such as that associated with the name of William Banting, the undertaker of St. James's-street, are still very complex. The influence of climate, race, and heredity comes into their discussion. What is certain, however, is that obesity is a serious menace to health and, far from being an enviable state, it is one which requires close attention.

THE AFTERMATH OF WAR.

THERE is no unofficial organisation for relieving the physical wreckage of the late war and helping the more or less disabled to help themselves which does more valuable and less ostentatious work than the Joint Council of the Order of St. John of Jerusalem in England and the British Red Cross Society, which has just issued its sixth annual report. That it appears only five months after the end of the Council's financial year is an indication of the business-like fashion in which its affairs are managed. It has been a year of internal change, Dr. F. N. Kay Menzies, who succeeded the late Sir Napier Burnett as Director of the important Hospital and Medical Services Department, having been appointed principal medical officer to the London County Council, and Mr. R. H. P. Orde, who has had a long experience of the Department, having taken his place as Acting Director. The Council has always been well served, and there is every reason to hope that the loss of two distinguished directors in rather rapid succession will in no way reduce the value of its work. That work is not confined to dealing with the disabled, for it keeps as watchful an eye upon the provincial hospitals as the King's Fund does upon those in the London district, and manages an ambulance service which annually breaks its own "records," and thus helps very materially towards filling a gap which is even now by no means completely closed. The purely after-war activities of the Council, as set forth in the report, are many and extend to all ranks of the Services, but perhaps the most important of them are those undertaken by the Auxiliary Hospitals for Officers Department which seeks to relieve ex-officers suffering from sickness or disablement attributable to, or aggravated by, their service in the war. More than 17,500 of such cases have been helped during the last six years, and it is melancholy to have a record that the majority of them have been tuberculosis cases. The Department puts them into hospital at Brighton, assists them to go to Switzerland or the Riviera, helps them with the cost of treatment while their cases are being officially investigated, and does not pass over unnoticed those whose applications have been rejected by the Appeal Tribunal. There are, unhappily, still many ex-officers who require surgical, medical, or convalescent treatment for disabilities for which the Ministry of Pensions could not accept liability, but are unable to pay operation and nursing home fees. Here the hospital steps in with its inestimable boons and removes much bodily suffering and mental anxiety. As regards mere extent, however, the activities of the Emergency Help Committee stand at the head of all these works of mercy. Last year 17,535 cases were helped, and £100,000 a year is being spent, mainly in grants of a fixed amount, for some specific purpose calculated to confer permanent benefit. Very often the money is eventually refunded, and many men, their physical handicaps notwithstanding, have thus been enabled to become self-supporting. In addition to all this money is found for materials and training for bedside occupations, for drives and entertainments, and for Christmas gifts. The report makes a splendid record of public service, most of it performed voluntarily by helpers whose patience and sympathy provide the human touch that lights up so many lives upon which the shadow of war has fallen, never entirely to be removed.

ACUTE NEPHRITIS IN CHILDREN.

A STUDY of the characteristics of the two principal forms of acute nephritis met with in children by Dr. Kenneth D. Blackfan,[1] of the Harvard Medical School, contains many points of interest. Dr. Blackfan's account suggests that the differentiation of these types is more complete than is usual in this country; of 41 cases 24 were definitely glomerular and 14 tubular, only three being mixed types. None of the cases described were scarlatinal. A table shows the distinctive features of the two types. Among the characteristic signs of glomerulo-nephritis are marked hæmaturia, high non-protein N-content of the blood, increased arterial tension, and frequent occurrence of uræmia. The tubular form is characterised by marked albuminuria and œdema, normal arterial tension and non-protein N-content of the blood, and the rare occurrence of uræmia. In fatal cases the condition of the brain showed distinctive differences which are held to be of significance in determining the presence or absence of the so-called uræmic symptoms. The author prefers to call the latter "cerebral" symptoms, as he believes that they are the results of mechanical intracranial conditions rather than of raised blood-urea. In tubular cases the brain showed a spongy œdema, comparable to that of the tissues, while in glomerular cases it was firm and tense, with flattening of convolutions and a tendency to the formation of a medullary pressure-cone. It is suggested that the causal sequence of events is (1) œdema of brain, (2) increased intracranial pressure, (3) raised arterial tension and the symptoms commonly called uræmic. The author claims that this hypothesis is confirmed by the results of lumbar puncture. He found that early in the disease there was a great increase of intrathecal pressure, but at a later stage this was not so, and he considers that this is explained by the occlusion of the arachnoid foramina occasioned by the increased pressure. This explanation is perhaps open to criticism; if the intracranial conditions are as described it might be expected that lumbar puncture would be a highly dangerous procedure, and the author might be considered fortunate in not having to record cases of fatal termination through impaction of the pressure-cone. In the summary it is stated that lumbar puncture should be used guardedly for this reason. Treatment

[1] Bulletin of the Johns Hopkins Hospital, August, 1926.

of this type of nephritis was directed by Dr. Blackfan towards the reduction of the intracranial pressure, and was found to be effective in relieving the cerebral symptoms. Intravenous injection of a 1 per cent. solution of magnesium sulphate was found to reduce the arterial pressure, and presumably the intracranial pressure, considerably and immediately; this was accompanied by the administration of large doses of the same salt by the mouth and rectum, the intravenous injection being repeated, if necessary, on the following day.

INFLUENZA IN SCOTLAND.

IN the Scottish Registrar-General's return for the quarter ending June 30th, 1926, there is shown a somewhat striking increase in the deaths from influenza. The total number of deaths for the quarter was 797, as against 198 for the corresponding quarter of 1925. The contrast invites examination. Of the 797 cases, 515—that is about 64 per cent.—occurred in the 16 principal towns. But the distribution over the months was unequal. In the month of April there occurred 330 deaths, in May 68, in June 17. When we analyse this still further in the light of the weekly returns we find that in the four successive weeks of April, the deaths from influenza were 81, 115, 80, 54. In May the figures tapered off as follows: 27, 25, 17, 15, 6. In June they were 6, 2, 3, 5. Thus, of the total town deaths (515) about 64 per cent. occurred in the month of April. It may, therefore, be taken that of the deaths for all Scotland (797) the great majority occurred in the first three weeks of April. This is rather a striking fact. As a rule infectious diseases sink to their lowest for a period in April. Obviously influenza has, this year at least, not followed the rule. If, however, we look back a little, the increase, though great, is not so sudden as it looks. There were 40 deaths from influenza in January, 35 in February, and 100 in March. The epidemic was on the rise. If we look back to 1924 we find that the deaths in the second quarter of that year were 767. Of these 224 occurred in the principal towns, and of these again 153 occurred in April. It may be assumed that approximately the same proportion occurred in the other areas of Scotland. The question, therefore, arises whether we have not here in 1926 the peak of another small wave of influenza. Dr. Brownlee, in his analysis of influenza epidemics, finds that in the minor waves between the great pandemics there is usually an interval of 33 weeks. In 1924 the total deaths from influenza were 2490. In 1925 they fell to 1246. In 1924, in the principal towns, the lowest number of deaths occurred in August. But as in 1925 there were 1246 deaths, the way is not quite clear for suggesting that the 33 weeks period has been verified. We seem still to be living among the wavelets of the 1918 epidemic. In the years 1918–25 the Scottish deaths from influenza were 11,111, 7215, 1339, 1330, 3706, 531, 2490, 1246. The great drop in 1923 suggests that there must be some change in the method of record. Otherwise the stream of cases has been unbroken. In the light of this sequence, and particularly in the light of the facts for 1924, the sudden increase of deaths in April, 1926, does not appear so exceptional. But deaths from influenza are not the whole case. Deaths from pneumonia and influenzal pneumonia are equally striking. For the second quarter of the year 1924 the deaths from pneumonia and influenzal pneumonia were 1568, in 1925 they were 1142, in 1926 they were 1536. The weekly returns for the principal towns show that the great incidence, as might be expected, is in the cities. The respiratory deaths as a whole show an increase in April, May, and June, corresponding to the increase in influenza. Thus, in April there were 895 deaths, in May 465, in June 274, and in July 245. It is clear that the influenza outburst was associated with an outburst of pneumonia, influenzal pneumonia, and bronchitis. The relations between influenza and the pneumonias are still difficult to define and the question arises whether some of these outbreaks may not be pneumonia complicated by influenza rather than influenza complicated by pneumonia. It is certain that where influenza intervenes the pneumonia death-rate rises. Whether this applies to all "types" of pneumonia is still for investigation. From 1918 onwards, as in influenza, the stream of the pneumonias goes on unbroken. At least in some areas pneumonia continues to increase. Pneumonia and influenza seem to vary more or less together.

SYMBIOSIS.

SYMBIOSIS is always a curious and interesting topic. The word has been used in a variety of meanings, and has not infrequently been the peg on which extravagant imagination and bad technique have hung their confusing products. In a limited pathological sense it is often important to know, and generally difficult to determine, whether the total action of two infecting organisms is the sum of their separate actions, or whether something additional is achieved when they act jointly. The streptococcal invasion of a tuberculous lung to which the symptoms of phthisis are so largely due, or the purification of a stinking wound by the "Reading" bacillus are hardly cases of symbiosis properly so-called, but they are examples of a large group of occurrences round which Dr. Aldo Castellani writes an interesting article in the *Journal of the American Medical Association* (1926, lxxxvii., 15). His original observations fall under two headings. In the first place he reviews a number of cases where two organisms together will do more in a test-tube than the sum of their separate actions. Thus the typhoid bacillus produces acid and no gas when grown in mannite or maltose; Morgan's bacillus does not ferment either substance; a mixture of the two bacilli ferments both carbohydrates with the production of acid and gas. Other examples of the same kind were found in studying the separate and combined actions of the yeasts and bacilli of which ordinary commercial yeast is made up. In the second place he cites three examples of clinical diseases where two organisms are concerned. Trichomycosis nigra is a disease of axillary and pubic hair, in which small black nodules on the hairs are made up of a fungus (*Nocardia tenuis*) and a pigment-producing coccus (*Micrococcus nigrescens*). In trichomycosis rubra the same fungus is associated with a coccus which produces red pigment. In a stomatitis, clinically clearly distinct from thrush, he has found a yeast-like fungus (*Cryptococcus graciloides*) with a bacillus (*B. vermiculoides*). It is obviously difficult in these cases of surface lesions to be sure, or to furnish clear proof, that some associated action is going on which is an essential feature of the disease. The facts are, however, suggestive, and the ideas in Dr. Castellani's mind are worth consideration.

LEAGUE OF MERCY.—In 1925 the League gave £15,000 to King Edward's Fund, making a total so contributed of £383,000 since the League was started in 1899. In addition £9901 was granted to extra metropolitan hospitals. The total amount that has been distributed to hospitals now reaches £457,732.

GERMAN ASSOCIATION OF UROLOGY.—This Association will meet from Sept. 30th to Oct. 2nd in Vienna. A very full programme has been arranged. On Sept. 30th the subject of Pain and how to Combat it in Urology will be discussed in the morning, while for the afternoon session 42 communications on the Pathology of the Kidney and the Ureter have been offered. On Oct. 1st in the morning the Pathology, Pharmacology, and Therapy of Anuria will be the subject of discussion, while in the afternoon, after a business meeting, the Association will receive communications on the pathology of the bladder and prostate. On Oct. 2nd the morning will be devoted to a discussion on malignant growths of the bladder, and the afternoon to one on the pathology of the urethra and genital passages. Among those taking part are V. Blum and F. Necker (Vienna), Georges Luys (Paris), H. Wildbolz (Berne), O. S. Lowsley (New York), L. Casper (Berlin). Further information may be obtained from the President of the Association, Prof. V. Blum, Alserstrasse 13, Vienna VIII.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXXXVIII.—THE MEDICAL TREATMENT OF CHRONIC DIARRHŒA.

I.—INVESTIGATION OF THE CASE.[1]

THE management of a case of chronic diarrhœa must be based on a clear appreciation of the cause of the symptom. Palliative treatment with bismuth, chalk, or opium, is rarely indicated and never satisfactory. Whether in a persistent or recurrent form diarrhœa may be the leading complaint in so wide a group of diseases that an enumeration of these, together with a brief account of their main clinical features, must be accepted as a proper preliminary to any discussion of therapeutics. An enumeration of the more common types of chronic diarrhœa is appended. As the diagnostic importance of these two observations is very great, yet not always recognised, it is also well to insist that *no case of chronic diarrhœa can be regarded as having had a full clinical examination*, unless this has included (1) *a digital examination of the rectum, and* (2) *a naked-eye inspection of the stools.* Some cases will require a more searching inquiry with laboratory or other accessory diagnostic methods.

Diarrhœa of Gastric Origin.

This is a condition dependent on gastric achylia—a painless diarrhœa occurring especially in the early morning before breakfast and after meals. There are usually two to four actions per diem, occasionally six to eight. Stools are soft and light brown. No blood or mucus is present, and abdominal and rectal examinations are negative. Occasional associated symptoms are (1) acne rosacea and morning nausea when the achylia is due to chronic gastritis; (2) pernicious anæmia. The diarrhœa may precede the development of the anæmia by several years. Test-meal shows absence of free hydrochloric acid. Microscopic examination of stools may show excess of undigested meat fibres and other evidence of alimentary "hurry." X ray after barium meal shows "gastric hurry."

Diarrhœa of Colonic Origin.

This group includes cases associated with colonic and rectal carcinoma, chronic ulcerative colitis, the dysenteries, spurious rectal and colonic diarrhœas, and certain rarer forms.

(1) *Colonic and Rectal Carcinoma.*—Urgency, pain, and loss of weight are associated symptoms. Blood, pus, and mucus are present in stools, not always macroscopic, but usually more conspicuous the lower the situation of the growth. There are from three to four, up to 20 or more actions a day—the lower the lesion the greater the frequency. Sometimes diarrhœa and constipation alternate. Diagnosis is confirmed by digital or sigmoidoscopic examination, laboratory examination of stools, and X rays with barium enema.

(2) *Chronic Ulcerative Colitis* (non-specific), and *Chronic Bacillary Dysentery.*—These are usually associated with colonic flatulence and pain, frequent fluid stools up to ten or more per diem, with blood and mucus, anæmia, loss of weight, and tenderness along descending colon. Diagnosis is confirmed by sigmoidoscopy, which reveals a red, universally unhealthy, granular mucosa, flecked with muco-pus, bleeding easily, superficial ulceration, and, in severe cases, deeper irregular ulcers. Diagnosis of bacillary dysentery may occasionally be decided by recovery of the organism from direct swabbings through the sigmoidoscope or by serological reactions with the patient's serum against known types.

[1] An article in this series by Dr. Ryle on Chronic Diarrhœa: the Management of the Case, will appear in THE LANCET next week.

(3) *Chronic Amœbic Dysentery.*—In most cases, but not all, there is a history of residence in the tropics; frequently a mild diarrhœa with little or no pain and only slight disturbance of general health occurs. Macroscopic blood and mucus are not always noticed by patients. Sometimes there is tenderness over cæcum, ascending colon, or edge of liver. Diagnosis is confirmed by sigmoidoscopy, which shows small clear-cut rounded ulcers appearing as craters on small elevations, the intervening mucosa being healthy. Microscopic examination shows red cells, and, perhaps, amœbæ or cysts. Sigmoidoscope sometimes confirms when laboratory reports are negative.

(4) *Spurious Rectal and Colonic Diarrhœa* may be (*a*) due to *fæcal retention* or impaction in old or feeble subjects, when rectal pain or intermittent constipation and diarrhœa may be present, or a fæcal accumulation may be revealed on rectal examination; or (*b*) *muco-membranous colitis*, in which there are attacks of so-called "diarrhœa" alternating with periods of constipation, colonic pain, worse after defæcation, and passage of scybalous fragments and copious mucous shreds and casts. In these cases the colon is hyper-irritable and often easily palpable owing to spasmodic contraction. Commonly a history of abuse of purgatives and the well-known neuropathic associations may be obtained. Blood is rarely present. Sigmoidoscopy shows a mucosa normal or redder than normal, but not granular or ulcerated.

(5) *Rarer forms* of chronic intestinal diarrhœa include those associated with the terminal colitis of *Bright's disease* and with *amyloid disease.*

Diarrhœa consequent upon Diseases of the Absorptive System.

(1) *Tabes mesenterica* occurs generally in children or young adults, the mild cases reporting slight chronic diarrhœa with pale or yellow motions, vague abdominal pains referred to both iliac fossæ, slight afternoon pyrexia, and general symptoms suggestive of tuberculous infection; the more serious cases showing copious bulky evacuations, pale, greasy, and porridgy, stunting of growth, abdominal enlargement, slight anæmia, and sometimes tetany. Stools contain excess of fats in the form of soaps and fatty acids.

(2) In *cœliac disease*, pale, bulky stools as above with abdominal enlargement and infantilism are found. This disease is confined to early childhood.

(3) In *sprue* there is always a history of residence in the tropics, abdominal enlargement, sore tongue, great wasting, copious, pale, fatty and frothy stools, and frequently an anæmia resembling Addison's (pernicious) anæmia.

Chronic Diarrhœa from Tuberculosis of the Small Bowel.

This is usually a late complication of chronic pulmonary tuberculosis or grave abdominal tuberculosis. Frequency of stools is variable, commonly four to six in the day or more when ulceration extends to colon. Pain around the navel and in right iliac fossa, tenderness in right iliac fossa, and post-prandial diarrhœa, especially after hot drinks, are found. Stools are usually semi-fluid and light in colour, rarely showing visible blood, but giving positive chemical and spectroscopic tests. With associated glandular involvement there may be chalky stools, frothing under a stream of water, and showing excess of fatty acids and soaps under the microscope.

Other Forms.

Infective or irritative diarrhœa accompanying *chronic cholecystitis* and *appendicitis* is usually slight, intermittent rather than chronic, and associated with the local or dyspeptic symptoms and signs of these diseases.

In *pancreatic diarrhœa* the stools are copious, pale, and oily (steatorrhœa), congealing on a cold surface or caking on the top of a liquid motion. There is serious loss of weight. Fat globules are present;

also starch and meat fibres. The diastase test or glycosuria may give further evidence of impaired pancreatic function.

Nervous diarrhœa may be (*a*) a visceral neurosis expressing anxiety, always worse on certain occasions, and especially before public functions. As the uncertainty associated with all forms of chronic diarrhœa itself creates anxiety it is well to recognise that a nervous diarrhœa may have had its origin in some other disturbance of function; (*b*) an accompaniment of Graves's disease.

Diarrhœa due to excessive ingestion of carbohydrate is usually very mild—one to three soft actions a day with much intestinal flatulence. It accompanies an excessively starchy diet and deficient exercise. French authors lay more stress upon this condition than is usual in this country, and describe a variety with frothy, gaseous motions.

Diarrhœa following gastro-enterostomy may manifest itself in (*a*) benign, or in (*b*) grave form. (*a*) In the benign form a too-patent stoma is associated with rapid evacuation of the stomach and overloading and irritation of the small bowel. Stools are light in colour. There may be loss of weight. The microscope shows poor digestion of meat fibres and fats, owing to precipitate passage of the gastric chyme. (*b*) The grave form is associated with gastro-colic or jejuno-colic fistula; serious loss of weight, pain, eructations of foul gas, and sometimes vomiting of fæces may occur. The diarrhœa may be very profuse. Confirm by X ray, which may show tenderness or other evidence of ulceration near the stoma, and fractional test-meal, which may recover colonic matter from the stomach. Occult blood is found in stools.

The treatment in some of these types, notably diarrhœa due to carcinoma, a terminal colitis, tuberculosis of the small bowel, cholecystitis and appendicitis, Graves's disease, and gastro-colic fistula, is either that of the primary disease, or surgical, or purely palliative, and will not here be considered. The management of cases of the other types will be outlined in Part II. of the present article.

JOHN A. RYLE, M.D., F.R.C.P. Lond.,
Assistant Physician to Guy's Hospital.

Special Articles.

MEDICINE AND THE LAW.

Workmen's Compensation: Lead Poisoning. Liability of Successive Employers.

IN 1906, as is well known, Parliament extended the system of workmen's compensation to illnesses due to industrial diseases such as lead poisoning. Section 8 of the 1906 Act had the effect of treating as an accident something which would not ordinarily be treated as an accident—namely, the occurrence of a progressive occupational disease at the point at which the workman is disabled by it. It was clear that this new principle would operate arbitrarily against a particular employer where the occupational disease had already set in while the man was in the service of previous employers. Parliament, therefore, made provision for exacting contributions from previous employers as well as dealing with the liability of the final employer. In the latter connexion Section 8 used significant language to emphasise the requirement of an immediate relationship between the time of the employment and the time of the industrial disease. If the workman "*at or immediately before the date of the disablement or suspension*" was employed in one of the specified processes, the disease "shall be deemed to have been due to the nature of that employment unless the employer proves the contrary." In other words, if the occupation is one which can give rise to the industrial disease, then there is a presumption in favour of the workman that the occupation did in fact give rise to the disease. But the presumption is not absolute; more than one workman has lost his claim for compensation on that account in circumstances which deserve examination. Those words, "at or immediately before the date of the disablement or suspension" are important. If there has been an interval between the employment and the disablement or suspension, then the presumption against the employer does not arise. Twelve years ago there was a case (Dean *v.* Rubian Art Pottery, Ltd., 1914, 2 K.B., p. 213) in which the workman had been employed down to April 18th and died of lead poisoning on May 15th. It was held that the comparatively short interval between these two dates was long enough to upset the presumption. This decision was followed early in the present year by the Court of Appeal in Blatchford *v.* Staddon and Founds, where the interval was a good deal longer. Blatchford was 53 years old; he had served in the navy until 1918 as a painter, and had contracted lead poisoning during that period of service, the symptom of drop-wrist having manifested itself. His subsequent employment as a painter under various employers was as follows. He got work in 1920 and for the whole of 1923 and the first half of 1924. From July to mid-September he was out of work; from then till mid-October he had a job; finally, after ten days' unemployment, he got work with fresh employers (Messrs. Staddon and Founds, the respondents in the action) from Oct. 23rd, 1924, till Dec. 12th, when he left because of illness. On July 13th, 1925, a certifying surgeon certified that Blatchford was then suffering from lead poisoning. This date was important because, under Section 8 (4) of the Act, unless the certifying surgeon can fix some date as that of the commencement of the disease, the date of disablement is to be construed as being the date when he gives the certificate. The result was that there was a seven months' interval between Dec. 12th, 1924, the date of employment, and July 13th, 1925, the date of disablement. Because of this interval Blatchford lost the benefit of the presumption that his lead poisoning was due to the nature of his employment with Messrs. Staddon and Founds. Having lost on this point as a matter of law, he could still succeed as a matter of fact if he could show that his lead poisoning was caused, or aggravated, or accelerated by his employment under Messrs. Staddon and Founds, but here the county court judge decided against him. The Court of Appeal said there was evidence on which the county court judge could have come to the conclusion which he reached, though perhaps not every judge would have come to it in that particular set of circumstances. The result was that Blatchford lost his application and lost his appeal. He had had, like any other plaintiff, to establish his case to the satisfaction of the county court judge, and the case which he had had to establish was that his disease was due to the nature of his employment under the employers whom he was suing and not that it was due to similar employment under other employers.

It was Blatchford's misfortune that his medical advisers were slow in diagnosing his disease as lead poisoning—an opinion which his medical and occupational history, if known, would have readily suggested. His panel doctor diagnosed his illness in December, 1924, as "general debility affecting the heart," and, according to the statement made in court of the facts of the case, it was not till the following June that the doctor attributed the illness to lead poisoning. The evidence of the effect of Blatchford's employment under the respondents was not put very high. His panel doctor said no more than that, if Blatchford had lead in his system before, his three months with the respondents might have aggravated it. On the other hand, one of the certifying surgeons said that if Blatchford had not been employed at all in that final November and December, "the symptoms would nevertheless have shown themselves and he would have been disabled as he now is."

Section 8 of the Workmen's Compensation Act of 1906 has, as Lord Justice Scrutton remarked, been

said to be the most obscure and complicated section in the Act. It was repealed with the rest of that Act when the consolidating Workmen's Compensation Act was passed in 1925; but it reappears in that Act in all its original obscurity and complication. It may be that Parliament really meant that if the applicant is a painter and suffers from lead poisoning, and if painting may produce lead poisoning, and if the applicant was last employed by the respondents, then the respondents must pay him compensation (whether or not the last employment had anything to do with creating or accelerating his lead poisoning) and get what contribution they can from his previous employer. But the Court of Appeal had already decided in Dean's case in 1914 that this was at any rate not what Parliament said. If the Court of Appeal is wrong upon this point, it can be overruled only by taking the matter to the House of Lords.

Dangerous Drugs Acts Regulations: Non-disclosure of Concurrent Treatment.

The Regulations made last July by the Home Office under the Dangerous Drugs Acts were designed to restrict inter alia the possession of drugs by a person who is obtaining prescriptions from several doctors concurrently. Prosecutions for infraction of these Regulations are already taking place. On Sept. 2nd a defendant was charged at the Westminster police-court with having been in possession on August 23rd of a quantity of heroin prescribed by a doctor without making disclosure that he was being attended by other medical practitioners for the same class of treatment. The accused stated that he had acted in ignorance of the recent Regulations. He said he had been under treatment from an acting police doctor and that, in the absence of the latter, he consulted another practitioner. The charges apparently had reference also to a third doctor, but no medical evidence was given at this stage of the proceedings. The accused did not accept the suggestion of the prosecution that he should plead guilty and have the case dealt with summarily. He was, therefore, remanded and presumably the doctors concerned will be required to give evidence. The difficulty of professional conduct which arises under the new Regulations, when a doctor is required to appear against his own patient and to disclose details of treatment, was not unforeseen by the committee which investigated the methods of restricting the supply of drugs to addicts. The legal view (that a doctor, if called upon by the court to give evidence of this nature, cannot refuse on the ground that the communication was privileged) is well known and can in this particular connexion be defended as being in the best interests of the patient. Presumably the offence, if an offence has been committed, is established if the medical practitioners formally identify their prescriptions and state (if such is the case) that they were not informed by the patient that he was under treatment by another doctor. The first point to be proved in the case is the possession of the drug, which is a matter of police evidence; the non-disclosure by patient to doctor is the next step. The police might in these cases be in a position to prove simultaneous supply and the fact that prescriptions had been obtained from more than one doctor at a time by calling as witnesses the persons who made up the prescriptions and handed the drugs over the counter. The chemist can say that he supplied the drug on the faith of the prescription, but he cannot prove the signature or initials at the foot of a prescription; still less, of course, can he prove what the patient said, or did not say, to the doctor.

Prosecutions of this kind should be given the utmost publicity. The course of action which the Regulations require is one of which many defendants are likely to plead ignorance. Everyone, according to the English legal principle, is supposed to know the law, or, to put the doctrine in a slightly milder form, no one is entitled to plead ignorance of the law. Genuine ignorance of the new Regulations will be no defence to a charge thereunder, though it may be an element tending to mitigate sentence.

METROPOLITAN ASYLUMS BOARD.

MORE SAMPLES OF THE YEAR'S WORK.

A LARGE number of scientific papers are included in the medical section of the annual report for 1925–26 of the Metropolitan Asylums Board, whose general scope has already been indicated.[1] Two of these papers were summarised in our issue of Sept. 4th. These and the additional summaries which follow may serve to give an idea of the wide scope and progressive character of the Board's medical work.

HOSPITAL SCHOOLS.

When day-schools for the physically defective were instituted it was apparent that the time-table and curriculum of the ordinary elementary school could not be used without modification. Special regulations were issued by the Board of Education which required that a school shall hold not less than 400 meetings in the year, each meeting lasting, as a rule, not more than two and a half hours, and providing for at least one and a half hours of secular instruction, apart from any time given to registration and recreation. The curriculum should include such "ordinary subjects" as English (speaking, reading, literature, writing, composition, and recitation), arithmetic, the knowledge of common things (nature study and observation lessons), history, geography, and singing. Not less than six hours of manual instruction must be given weekly. A grant, based on average attendance, is payable to managers of special schools not provided by authorities. The grant is £15 10s. for each unit of average attendance at a certified boarding school, increased to £24 10s. if it is an open-air boarding school for children suffering from tuberculosis, debility or pre-tuberculous conditions.

In his report on teaching arrangements at hospital schools Dr. W. T. Gordon Pugh summarises the relevant regulations and compares the position of special and hospital schools. The regulations for special schools, he says, were applied to hospital schools without modification, save the insertion of a note that in schools where children were taught in bed the teaching must often be mainly individual in character, and the time-table should be planned to provide suitable occupation for sick children. In some instances little or no difficulty arises. This is so when the number of patients in a ward approximates to that usually accommodated in a school class-room; when, through a high average age of the children, interference with the teaching arrangements by quarantine is only very occasional; and when the medical or nursing treatment necessary during school hours is practically negligible. In other institutions, on the contrary, it is impossible to conform with the regulations without undue expenditure. Difficulty occurs, for example, when the wards are small and the potential pupils in them considerably fewer than the number laid down for each teacher in the regulations. Again, if change of patients is relatively frequent, particularly if young children are received, there is a greater liability to the introduction of infection with consequent quarantine. Also, it is impossible in many cases to arrange for the full school hours when the hospital provides forms of treatment which can only be given adequately and economically in special departments at a distance from the wards—e.g., light treatment, medical electricity, massage, gymnastics, application of radium, and, to a less extent, attention by operating surgeon, dentist, oculist, and splint maker. In large institutions the transport of patients for these purposes still further consumes time. Thus, the more varied a hospital's acitivities, the more difficult it is to conform in exact detail with regulations originally designed to suit a day-school.

Dr. Pugh gives a short account of the arrangements at three full-time hospital schools—St. Vincent's

[1] THE LANCET, August 21st, p. 392.

Orthopædic Hospital at Pinner, the Liverpool Hospital for Children at Leasowe, and Princess Mary's Hospital, Margate—and concludes with a description of the arrangements at Queen Mary's Hospital, of which he is medical superintendent. Several years ago, he says, the subject of education received careful consideration at this general hospital for children, where the patients vary in age from a few months to 16 years, and where all the difficulties mentioned above as liable to occur in the case of full-time hospital schools actually prevail. The accommodation of a ward is 16, and of a verandah 15, and that an attempt to teach the patients of both together was not a success. If all the regulations of the Board of Education were to be carried out, it was estimated that at least 40 assistant teachers would be required to work wards and verandahs as separate units. In view of the medical difficulties already referred to, it was felt that the great expenditure which this would entail was not justifiable. Since the hospital and school are provided by a Poor-law authority, no grant is payable by the Board of Education. The principal features of the scheme which was eventually approved are :—

(*a*) A teacher takes two classes, each of which contains usually 12–16 pupils—i.e., she takes the ward patients from 9.10 to 10.25 A.M. and from 1.30 to 2.45 P.M., and the verandah patients from 10.35 to 12 noon and 2.45 to 3.55 P.M. On alternate days this arrangement is reversed; this allows of the medical officers, masseuses, and sisters performing their duties without interfering at all with the teaching.

(*b*) The Dalton system of teaching has been adopted in a modified form.

(*c*) Nearly as much time is given to "ordinary subjects" as in the average cripples' school, for it is felt that these are of paramount importance. An exception has been made in the case of singing, to which less time is allocated.

(*d*) The time allowed for manual instruction has been reduced. This, however, is to some extent compensated for by the smallness of the unit allowing more individual attention, besides which suitable children are encouraged to continue their handwork out of school hours. As most of the pupils are in bed, and thus no real vocational handwork is possible, the time allowed for the latter at ordinary schools for physically defective children has not to be provided for.

(*e*) Physical exercise is undertaken out of school hours by trained medical gymnasts, one of whom works in connexion with each block for recumbent patients, and by the attendants in the ambulant boys' wards.

(*f*) Recreation and games do not occupy a place in the time-table, as it is not essential that the organisation of these should be undertaken by teachers. The patients play ordinary games under the supervision of nurses or attendants; chess and draughts matches take place between the senior wards: there are troops of scouts and guides; entertainments in the form of concerts, plays, conjuring or cinema are given almost weekly during the autumn and winter months; and many of the patients, both recumbent and ambulant, attend cricket and lawn tennis matches during the summer. There is a well-filled library. Every ward, too, is fitted with an aerial, and two loud-speaker valve sets and a number of crystal sets are in use for the patients' entertainment; it is likely that the wireless will prove of considerable educational value to older children who stay for a long period in hospital.

This scheme, says Dr. Pugh, has allowed the recommendations of the Board of Education to be reasonably closely followed in essential subjects. The teaching staff numbers 25, which would suffice at a day-school for the physically defective for an average attendance of 615. On an average there are 572 on the registers, and it is probable that, through the close individual attention which the smallness of the classes allows, and the regular attendance which is ensured, the general educational benefit received by these pupils at least equals that which is received by members of the larger classes of the ordinary day-school for the physically defective, notwithstanding the shorter duration of the meetings.

The following table is given by Dr. Pugh to show the hours per week allotted to the teaching of secular subjects included in the curriculum of the Board of Education in the schools described. In addition, time is allocated to scripture in each school:—

Hours allotted to—	Two P.D. day-schools.		Hospital schools.			
	A	B	St. Vincent's	Liverpool	Princess Mary's	Queen Mary's
Ordinary subjects	8½	10	8½	10	9½	7½
Handwork ..	6½*	7½*	6	6½	6	3½
Physical exercises	2½	2	½	1	1	1½

* Including craft work.

BALNEOTHERAPY FOR SURGICAL TUBERCULOSIS.

An institution at Cannes where sea bathing had an important place in the treatment of children suffering from tuberculosis, joint and bone disease, was recently described in our columns,[1] and the advantages of balneotherapy are well recognised. In this country, however, strong winds, rough seas, and unsuitability of tides make organised and continuous bathing difficult for many children, and any bathing at all may be impracticable for those who are so crippled that they have to wear splints or jackets. At Millfield, Rustington, Sussex, steps have been taken to institute a system of spraying the children with sea water while protected from the weather, and a description of the procedure is given by the visiting medical officer Dr. C. E. Last. Advantage was taken of the natural protection of a high hedge which separates the grounds of Millfield from the shore and which runs east and west. Sheltered compartments were made on both sides of this hedge by using 6 feet high wattle fencing, the compartments on the north side being used during a southerly wind, and those on the south side when the wind is northerly. A large raised tank has been erected close to the hedge, and this is filled with sea water in a few minutes by means of a hand-operated suction and force pump. A two-way pipe leads out of the tank, one to the north side of the hedge and the other to the south, and a sprayer is attached to one of them according to which side is being used for operations. According to their condition and capabilities, some of the children stand on wooden gratings for spraying, some sit, and others who normally wear splints or jackets are laid down on the beach. After spraying, their feet are put in a trough of hot water and they are rubbed down and dressed before leaving the shelters. Operations were begun on May 14th and discontinued on Oct. 10th, 1925; during this period over 2000 sprayings were recorded, and it will be interesting to hear more of the results of this experiment.

TREATMENT OF RINGWORM.

At the Goldie Leigh Homes at Abbey Wood the Board has departments for the treatment of skin diseases and of ringworm. During 1925 372 cases of ringworm were admitted, all of which were caused by the common fungus of ringworm in children—the *Microsporon audouini*—except four in which the large-spored *Trichophyton endothrix* was responsible. In the great majority of cases the ringworm was entirely confined to the scalp. In a few, patches were also present on the glabrous skin, and in several cases the glabrous skin alone was involved. Dr. J. M. H. MacLeod, consultant physician for skin diseases, points out that a certain number of cases are still being admitted which have been under treatment for varying periods with irritating antiparasitic applications, which have produced so much inflammation that it has been necessary to delay the exposure to the X rays, sometimes for weeks, to enable the inflammation to subside under soothing treatment before applying the rays. The number of such cases, however, is fewer than in the previous year, and he hopes "that in time it will be realised that the only

[1] THE LANCET, July 24th, p. 213.

effective treatment for ringworm of the scalp is the X rays, and that the less done to the cases before they are sent up to be rayed the better." The new apparatus and method of dosage, described in detail in the report for 1924, continue to give satisfactory results, and during the year there has been no case of X ray dermatitis, followed by permanent baldness, and only one case had to be partially re-rayed owing to insufficient depilation of the hair. The couch for restraining refractory cases is also proving adequate, and has rendered it possible to deal with many cases which otherwise could not have been rayed safely. It has also allowed of the treatment of a number of infants between 1 and 2 years of age without subsequent ill-effects.

INDIA.

(FROM OUR OWN CORRESPONDENT.)

Tuberculosis in Calcutta.

DURING 1924 the total number of deaths in Greater Calcutta was 30,822, which is equivalent to a mortality of nearly 30 per 1000 for the city. This figure was slightly higher than in the previous year, and an unsatisfactory feature was a rise in the number of deaths from tuberculosis. In Calcutta nearly all deaths from this disease are due to the pulmonary form, and the medical officer of health, Dr. H. M. Crake, thinks that the rarity of surgical tuberculosis (some 6 per cent. only of deaths from tubercle being due to this variety) is a consequence of the fact that Bengal cattle are rarely consumptive. Tuberculosis in India appears to run a very rapid course; possibly for this reason signs of old infection are comparatively uncommon amongst Indians. The death-rate varies in different classes of the community. Amongst Mahommedans in 1924 it was 3 per 1000; amongst Hindoos, 2·3; and amongst Indian Christians, who are few in number, it was 3·8. Far more striking, however, was the variation in mortality at different ages and in the two sexes. For boys between 10 and 15 years old the death-rate was only 0·45 per 1000, and for girls 2·2; but after this age there was a remarkable rise in the female mortality. From 15 to 20 years it was 6·6, and from 20 to 30 6·4 per 1000, and in the fourth quinquennium of life six times as many girls died of tuberculosis as boys. Dr. Crake attributes this high death-rate to the retention of the purdah system in the densely populated gulleys of a congested city, where it is difficult to secure absolute privacy without shutting out the light and air. The zenana is usually in the inner part of the house, ill lighted and ill ventilated, but effectually screened from observation, and in these unhealthy surroundings girls and young women are subjected, whilst still immature, to repeated pregnancies and long periods of lactation. Probably there are 10,000 cases of tuberculosis in Calcutta, and hardly any precautions are taken against the spread of infection. Thousands of consumptives are constantly spitting all over the place, and those who have to carry out the anti-tuberculosis scheme now approved by the Health Committee have a big task before them.

The Reorganisation of Public Health Activities in Bombay.

The report of a committee appointed by the Government of Bombay to consider the question of the reorganisation of the Public Health Department and the transfer of control of medical, vaccination, and veterinary staffs to district local boards, has been issued. They recommend that the control of the existing staff of the subordinate medical service should remain as at present, but that all new appointments should be left entirely to local boards, who should receive grants-in-aid to enable them to take over this responsibility. The result of the recommendation would be the ultimate assumption of control of the whole subordinate medical staff by the district local boards. As to recruitment, the committee hold that as vacancies occur they should be filled from doctors registered by the Bombay Medical Council, subject to the approval of the Surgeon-General, at a minimum salary of 50 rupees per mensem. Under the scheme outlined the civil surgeon would continue to inspect grant-in-aid dispensaries and his advice on technical and professional matters would be accepted by the local boards. The transfer of control of the veterinary staff is not recommended, but it is suggested that Government grants for the maintenance of veterinary dispensaries should be increased. As to the vaccination staff, their future is considered in connexion with the desirability of reorganising the public health department. It is the duty of district local boards to provide for medical relief and to undertake measures for the health, safety, and convenience of the public, and it is desirable that they should take in hand the sanitation of the districts. The committee consider it necessary that these bodies should appoint district health officers with sufficient establishment under them. They recommend that a district health staff should be appointed consisting of a health officer, inspectors, and sub-inspectors for each district according to its size and population, and make detailed suggestions as to the proportion of the cost of this scheme that should be borne by the Government. They consider it necessary to retain the existing officers of the Public Health Department for advising and guiding the new health staff appointed by the boards and recommend that the officers of the Public Health Department should continue to exercise their present powers of professional inspection and advice. They are of opinion that the appointment of the health staff by local boards should be made optional. They have also considered the question of the transfer of the function of maintaining vital statistics to district local boards, and consider it desirable that after the boards have appointed district health officers they should have control over the maintenance of vital statistics.

Vaccination in Bengal.

In the year 1924–25 over 2,661,000 persons were vaccinated in Bengal against small-pox. The primary vaccinations increased by more than 4 per cent. and revaccinations by 115 per cent., the average number of operations performed by each vaccinator in rural and municipal areas being 1492. Some 293,000 vaccinations were done in Calcutta. The report presented by Major A. D. Stewart records that the number of infants successfully vaccinated throughout the Presidency per 1000 of the population was 275, as compared with 262 in the previous year. Of the total of about 1,112,000 infants available for vaccination over 300,000 were dealt with and in some districts half the available infants were thus protected.

LONDON HOMŒOPATHIC HOSPITAL.—This hospital, which had been closed for alterations and redecorations, was reopened on Sept. 1st. The dispensary has been enlarged and re-equipped and a sunlight lamp has been installed in the Mechano-Therapy Department. The new works have cost £10,000, most of which has yet to be raised.

ENLARGEMENT OF CHARING CROSS HOSPITAL.—The recent purchase of the adjoining premises of the Royal Westminster Ophthalmic Hospital will involve the largest extension scheme in the history of Charing Cross Hospital. The institution has long been so badly cramped for room that many patients have had to be refused because there were no available beds and no space for increasing the number. An additional floor was added as a children's department which reached the permissible limits of height, while the basement and sub-basement are already utilised. The Ophthalmic Hospital building is not to be rebuilt, but will be so altered and adapted that it will provide a larger nose, throat, and ear clinic, more beds for heart cases, an extensive department for skin troubles, and a children's gymnasium, and permit of other developments. The cost of purchase and conversion will be £100,000 and a special appeal for that amount has been issued. The hospital has no debt and has paid its way since 1915.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1926.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register.

Achpise, Alexander, L.C.P. & S., 1923.
Alcorn, Robert George, L.R.C.S., 1874.
Anderson, George Marshall, M.B., 1925.
Anklesaria, Nadirsha D., M.B., 1921.
Annecke, Siegfried, M.R.C.S., 1921.
Anugraham, Anandanada, L.M.S., 1919.
Armstrong, Arthur C., *M.C.*, M.C.P. & S., 1918.
Arnason, Jon S., M.C.P. & S., 1919.
Arthur, Wilfrid S., M.C.P. & S., 1922.
Aucoin, Edmond L., M.D., 1920.
Auger, Emile L., M.D., 1921.
Azoulay, Leon, M.C.P. & S., 1924.

Backhouse, Thomas C., M.B., 1920.
Bacot, William R., M.R.C.S., 1887.
Bal, Jatindra N., L.M.S., 1922.
Balendra, Wytilingam, L.M.S., 1922.
Banerjee, Satis C., L.M.S., 1922.
Bardi, Dosabhai R., L.M.S., 1905.
Basu, Bijitendra, L.M.S., 1924.
Batra, Harnand L., M.B., 1924.
Bawden, John Clemence, L.S.A., 1894.
Baxter, Robert H., M.B., 1923.
Beamish, James Aylmer, M.B., 1907.
Bell, Christopher H. C., M.C.P. & S., 1919.
Bennett, Louis A., M.B., 1921.
Benzimra, Walter J., M.D., 1920.
Bessette, Ubald, M.D., 1921.
Betzner, Norman E., M.C.P. & S., 1917.
Bewes, Edward A., L.R.C.P., 1882.
Black, Howard, M.C.P. & S., 1919.
Blakey, Leonard C., M.C.P. & S., 1923.
Blaze, John R., L.M.S., 1924.
Borg, Paul, M.D., 1905.
Borrie, William G., M.B., 1920.
Bourdon, Charles A., M.D., 1920.
Bourget, Clermont, M.D., 1920.
Bourke, John, M.B., 1923.
Bowman, George M., M.C.P. & S., 1924.
Brachman, David Simon, M.R.C.S., 1916.
Brewer, Joseph, B.C., 1914.
Brisebois, Maxime, M.D., 1921.
Brown, William H., M.R.C.S., 1883.
Bullock, Arthur E., *M.C.*, M.B., 1888.
Bunn, Charles R., M.C.P. & S., 1919.
Burns, Charles W., M.C.P. & S., 1920.
Butters, Thomas L., M.C.P. & S., 1917.

Calnek, Stanley H., L.M.S., 1921.
Cameron, Charles William M., M.B., 1923.
Camilleri, Victor, M.D., 1914.
Campbell, William, M.C.P. & S., 1922.
Carroll, Charles R., L.M.S., 1906.
Carroll, James Francis, M.B., 1893.
Carruthers, Bruce M., M.B., 1915.
Casling, Paul V., L.M.S.S.A., 1924.
Cattell, Herbert W. J. J. G., L.R.C.P. & S., 1897.
Cezair, Hubert E. C., L.R.C.P. & S., 1921.
Chagnon, Deodatus T., M.D., 1921.
Chakravarti, Devendra N., M.B., 1923.
Chapman, Clement L., M.B., 1921.
Checchi, Cyril, M.B., 1915.
Clark, Warren F., M.C.P. & S., 1921.
Clarke, Arthur, M.R.C.S., 1862.
Clarke, John M., M.B., 1921.
Clegg, Richard, L.R.C.P., 1881.
Closs, James R., M.B., 1910.
Clowes, Arthur L., M.B., 1924.
Cohen, Cedric K., M.B., 1915.
Cohen, Reuben, M.C.P. & S., 1924.
Collins, Ralph B., M.C.P. & S., 1921.
Colquhoun, Keith G., M.B., 1915.
Cooper, Meherjibhoy B., L.M.S., 1910.
Corker, Joseph, M.B., 1904.
Cox, Stafford M., L.R.C.P., 1887.
Crowe, Loren L., M.C.P. & S., 1923.
Cumming, Patrick G., M.R.C.S., 1921.

Dandurand, Jeremie N. E., M.D., 1924.
Daniel, William P. T., L.S.A., 1890.
Daruvala, Phiroze P., L.M.S., 1924.
Dasgupta, Arunkumar, M.B., 1921.
Davies, Henry A. B., M.R.C.S., 1884.
Davis, Robert Evans Stuart, M.B., 1881.
Day, Oswald J., M.C.P. & S., 1921.
Delage, Charles E., M.D., 1920.
De Ryck, Frans, M.D., 1915.
Desrochers, Antonio, L.M.S., 1922.
Desrosiers, Willie, M.D., 1921.
Dey, Joseph C., M.B., 1912.
D'Monte, Rose C., L.M.S., 1922.
Dobrashian, George R., M.R.C.S., 1913.
Donaldson-Sim, Ernest A., M.R.C.S., 1901.
Donevan, Frederick J., M.C.P. & S., 1919.
Drennan, Ralph M., M.B., 1924.
Drew, Thomas M., M.B., 1905.
Duff, Thomas A. J., M.C.P. & S., 1919.
Dunning, Charles S., M.C.P. & S., 1920.
Dyck, George, M.D., 1919.
Dymond, Miss Bertha, M.C.P. & S., 1919.

Edmunds, Winifred P., M.R.C.S., 1924.
Elliott, Thomas W. E., M.B., 1915.
Etsell, Thomas E., M.C.P. & S., 1920.

Fairfax, Edward W., M.B., 1901.
Faraci, Giuseppe, M.D., 1908.
Faucher, François, M.D., 1920.
Ferguson, George Gunnis, M.B., 1886.
Firth, Ian G. M., M.B., 1915.
Fitzgerald, Gerald P., M.B., 1920.
Fitzgerald, John C., L.R.C.P. & S., 1924.
Flanagan, Patrick J., L.R.C.P. & S., 1890.
Flecker, Hugo, M.B., 1912.
Flood, Patrick J., L.R.C.P. & S., 1917.
Fowler, Cosmo W., M.B., 1914.
Franklands, Herbert W., M.B., 1914.
Freele, Lloyd W. M., M.C.P. & S., 1919.
Furey, Nicholson W., M.C.P. & S., 1919.
Furness, Arthur W., M.D., 1922.

Gaden, Keith B., M.B., 1924.
Gallacher, Michael J., M.B., 1915.
Gangriwala, Najmuddin K., M.B., 1923.
Gaudet, Camille E., L.M.S., 1914.
Gaulin, Eugene, M.D., 1922.
Gault, Estelle R., M.B., 1921.
Genest, Laurent W., L.C.P. & S., 1923.
Ghows, Ismail M., L.M.S., 1918.
Giblin, William E., M.B., 1915.
Giffard, Henry E., M.R.C.S., 1877.
Giglioli, Guido Y., M.D., 1904.
Gillam, George J., M.C.P. & S., 1922.
Glassford, Eric MacA. G., M.B., 1921.
Goode, Christina L., M.B., 1901.
Goode, George Ernest, M.R.C.S., 1900.
Goodridge, Leslie A., L.M.S., 1922.
Gopalan, Vaidhyanatha, L.M.S., 1920.
Gore, Dinanath N., M.B., 1920.
Graham, John A., M.C.P. & S., 1922.
Grant, Harry G., M.D., 1913.
Greco, Vincenzo., M.D., 1921.
Greene, Arthur P., L.R.C.S., 1872.
Greenidge, Hewburn N., M.C.P. & S., 1921.
Grey, Harry, M.C.P. & S., 1916.
Grier, Reginald T., M.C.P. & S., 1920.
Grieve, Herbert R. R., M.B., 1923.
Grimmett, Roger S., M.C.P. & S., 1924.
Grimoldby, James, L.M.S.S.A., 1908.
Guelpa, Guglielmo G., M.D., 1921.
Gunne, Livingston G., M.C.P. & S., 1916.
Gupta, Sukumar, M.B., 1922.

Hakim, Bakhtyar R. R., M.B., 1923.
Hall, Hector C., M.C.P. & S., 1920.
Hamilton, William, M.D., 1877.
Hansman, Frank S., M.B., 1922.
Haq, Anwarul, M.B., 1921.
Harper, James Watkins, M.C.P. & S., 1918.
Harrison, Herbert M., M.R.C.S., 1895.
Harvey, Miln C., M.C.P. & S., 1923.
Haughton, Edward, M.R.C.S., 1858.
Heaton, Arthur F., M.R.C.S., 1892.
Henderson, Randolph R., L.M.S., 1924.
Henderson, Wm. A. L. H., M.B., 1915.
Hensley, Philip H., L.S.A., 1887.
Heringer, Wilfrid J., M.C.P. & S., 1918.
Hewson, Robert D., M.C.P. & S., 1920.
Higgins, Thomas F., L.R.C.P. & S., 1914.
Hislop, James G., M.B., 1921.
Ho Asjoe, Salomon, L.R.C.P. & S., 1922.
Hodgson, Harold W., *M.C.*, M.R.C.S., 1900.
Hope, Percy Lake, M.R.C.S., 1899.
Hopwood, Cecil H., M.B., 1902.
Hoyten, William J., M.R.C.S., 1894.
Humphry, Ernest, L.S.A., 1885.
Hunter, Alexander, O.B.E., L.R.C.S., 1863.
Hutchison, Keith O., M.C.P. & S., 1924.
Ito, Koken, M.B., 1923.

Jackson, Frederic S., M.D., 1910.
Jackson, Joseph L., M.C.P. & S., 1924.
Jacobs, Charles, M.D., 1915.
Jinadasa, M., L.M.S., 1910.
Jones, William E., M.C.P. & S., 1919.
Josa, Giam B., M.D., 1915.
Joshi, Manchershah F., M.B., 1916.
Joyal, Joseph E. I., M.D., 1921.
Judson, Frank McD., M.C.P. & S., 1924.

Kacker, Pooran C., M.B., 1923.
Kenealy, Arabella M., L.R.C.P., 1883.
Kennedy, Basil C., M.B., 1919.
Kenny, Maurice A., M.C.P. & S., 1921.
Kent, Hugh Braund, M.R.C.S., 1908.
Kerr, Frank R., D.S.O., M.B., 1914.
Khew, Tham Y., L.M.S., 1919.
Kines, Roy M., M.C.P. & S., 1923.
Kirby, Rowland A., M.R.C.S., 1893.
Kirkham, Frederick R., M.C.P. & S., 1920.
Kirti, Kanti C., L.M.S., 1921.
Kirwan, Patrick M., M.D., 1920.
Kiteley, James A., M.D., 1917.
Klein, Keith, M.B., 1924.
Knight, Glen A., M.B., 1897.

Lane, Muriel S., M.B., 1924.
Lanzon, Edward, M.D., 1916.
Lavoie, Francois M., M.C.P. & S., 1921.
Lawson, Elston H., M.C.P. & S., 1919.
Leech, John Richard, M.D., 1873.
Lendon, Guy A., M.B., 1920.
Ligoure, Clement C., L.M.S., 1919.
Locke, Frederick D., M.C.P. & S., 1920.
Loh, Poon L., L.M.S., 1918.
Lucas, Melville F., M.C.P. & S., 1920.

MacAvelia, Millard T., M.C.P. & S., 1920.
McBride, Clifford D., M.C.P. & S., 1923.
McCaffrey, Ernest M., M.B., 1919.
McCallum, Donald, M.C.P. & S., 1919.
McCarville, Charles R., L.M.S., 1921.
McColl, Neil, M.B., 1919.
McConnell, William F., M.B., 1920.
Macdonald, James O., M.B., 1920.
MacDonald, William M. C., M.B., 1923.
McDonnell, Alexander J. V., M.R.C.S., 1915.
MacDougall, Dan, M.C.P. & S., 1920.
McElwee, Daniel, M.B., 1920.
McFadyen, Oscar J., M.D., 1922.
Macfarlane, Harold G., M.C.P. & S., 1920.
McIntyre, Archibald J., M.C.P. & S., 1919.
MacKay, Jean C., M.D., 1917.
McKay, Joseph W., L.M.S., 1920.
McKenzie, Hector, M.C.P. & S., 1920.
Mackenzie, John, M.B., 1898.
Mackenzie, Samuel R., M.D., 1912.
McKenzie, William G., M.C.P. & S., 1921.
Mackie, John P., M.C.P. & S., 1922.
McKie, Joseph G., M.C.P. & S., 1920.
MacKinnon, Albert H., L.M.S., 1919.
MacKinnon, Alexander G., M.C.P. & S., 1919.
MacLean, John, M.C.P. & S., 1916.
McLeod, John H., M.C.P. & S., 1921.
MacMurchy, John N., M.C.P. & S., 1924.
McMurtry, Gilbert J., M.D., 1923.
Maddison, Jessie C., M.B., 1902.
Magnan, Louis A., M.D., 1922.
Makuda, Ichiro, M.D., 1922.
Malfatti, Hector, M.D., 1903.
Marcellus, Eathen H., M.C.P. & S., 1918.
Marchant, Gladys H., M.B., 1921.
Marshall, William A., M.D., 1920.
Martin, Charles A., M.C.P. & S., 1923.
Martin, Stanley H., L.M.S., 1924.
Mathers, James A., M.C.P. & S., 1919.
Matheson, Henry A., M.C.P. & S., 1919.
Matheson, James R., M.C.P. & S., 1920.
Mattice, Richard L., L.R.C.P., 1902.
Mehta, Amolak R., M.B., 1921.
Mehta, Daulat R., M.B., 1921.
Mendelsohn, Harris, *M.C.*, M.B., 1919.
Menon, Tottakkat K., M.B., 1912.
Meredith, William R., L.R.C.P. & S., 1901.
Merrick, Charles G., M.C.P. & S., 1924.
Miller, Jean C., M.D., 1924.
Mills, Cecil V., M.C.P. & S., 1919.
Mills, Edward S., M.C.P. & S., 1924.
Monfette, Georges, L.M.S., 1914.
Monteiro, Valery V., M.B., 1921.
Moon, Harold R., M.C.P. & S., 1921.
Morrison, George W., L.M.S., 1921.
Murdoch, John A. M., L.M.S., 1912.
Murtagh, Andrew P., L.M.S., 1917.

Napier, Lionel E., M.R.C.S., 1922.
Nasmyth, Roy D., M.C.P. & S., 1920.
Nayar, Des R., M.B., 1924.
Neal, Leo A., M.B., 1922.
Neilson, Robert M., M.C.P. & S., 1916.
Nelson, William T., M.B., 1922.
Newton-Brady, Arthur, M.B., 1914.
Nye, Leslie J. J., M.B., 1915.

O'Callaghan, Herbert, M.B., 1913.
O'Connell, John F., L.R.C.P. & S., 1922.
O'Connor, William P., M.R.C.S., 1886.
Olaribigbe, Alumu O., L.R.C.P. & S., 1915.

Paddison, Edmund H., M.R.C.S., 1878.
Page, Frederick W. T., M.R.C.S., 1897.
Page, William R., M.B., 1921.
Pagonis, Peter J., L.S.A., 1903.
Pain, Francis, M.R.C.S., 1886.
Palmer, Arthur E. A., M.B., 1912.
Pandit, Sudershun H., L.M.S., 1924.
Panikker, Aerath N. N., M.R.C.S., 1919.
Papenfus, Edmund J., M.R.C.S., 1918.
Paradis, Charles R., M.C.P. & S., 1922.
Parbury, Frederick D., M.R.C.S., 1902.
Parry, Claude A., L.R.C.P. & S., 1924.
Partridge, Arthur J., M.B., 1892.
Patrick, Charles A., M.B., 1879.
Patterson, William John, M.B., 1904.
Patton, William, M.B., 1904.
Paul, Gilbert E., M.R.C.S., 1916.
Peatman, William Z., M.C.P. & S., 1921.
Pellew, Leonard J., M.B., 1915.
Pennington, Louise A., L.M.S., 1916.
Pepler, William H., L.R.C.P., 1887.
Peregrine, Edgar F. J., M.R.C.S., 1920.
Perera, Julius Ernest, M.B., 1903.
Perkins, Herbert F., M.B., 1902.
Perras, Joseph H. F., M.D., 1919.
Perron, Joseph M., M.D., 1920.
Perry, Sir Alan, L.S.A., 1883.
Petherbridge, Walter C., M.B., 1924.
Petrie, Frederick McG., M.C.P. & S., 1919.
Pfeiffer, Gordon H., M.B., 1921.
Phaneuf, Joseph E., M.D., 1920.
Phillippe, Clement, M.D., 1918.
Phillips, John W. G., M.R.C.S., 1916.
Pickup, William A., M.D., 1921.
Pienaar, Frederick W., M.B., 1920.
Pigott, Louis M., M.B., 1915.
Pinto, Joseph O., L.R.C.P., 1887.
Piper, Francis P., M.R.C.S., 1893.
Piplani, Jagan N., M.B., 1924.
Pippy, Olive, L.M.S., 1919.
Pittar, Rowland J. G. A., M.B., 1922.
Pitts, Arthur G., M.R.C.S., 1901.
Plouffe, Adrien F., M.D., 1920.
Pollock, John H., M.B., 1913.
Pollock, William, M.B., 1879.
Pooler, Edward L., M.D., 1885.
Pope, Frederick S., M.R.C.S., 1916.
Pott, Francis H., M.R.C.S., 1885.
Powell, Fred H., L.R.C.P., 1886.
Power, John W., L.K.Q.C.P., 1886.
Power, Patrick J., L.R.C.S., 1887.
Prickett, Marmaduke, M.R.C.S., 1878.
Proctor, John S., L.R.C.P. & S., 1891.
Proksch, Louis L., M.B., 1895.
Proujansky, Joseph, M.R.C.S., 1920.
Pullen, Ralph S. McD., M.R.C.S., 1893.
Pulvertaft, Robert J. V., M.R.C.S., 1924.
Puri, Jagan N., M.R.C.S., 1916.
Purnell, Kenneth C., *M.C.*, M.B., 1919.
Purvis, George S., M.C.P. & S., 1920.

Quigley, Joseph P., M.R.C.S., 1912.

Radloff, Theodor, M.B., 1920.
Radmore, George R., L.S.A., 1885.
Rae, David E., M.B., 1908.
Rahim, Syed A., M.B., 1920.
Rajah, Kandappah, L.M.S., 1922.
Ram, Tirath, M.B., 1921.
Raman Pillai, Kouikal P., M.B., 1921.
Rao, Srinivas Ram, L.A.H., 1912.
Rao, Stephen R., L.M.S., 1910.
Raphael, Howard M., M.C.P. & S., 1920.
Rasul, Sheikh G., L.R.C.P., 1913.
Rau, Bantwal N., M.R.C.S., 1921.
Rawlinson, Rupert L., B.C., 1917.
Ray, Hemanta K., L.M.S., 1921.
Ray, William, M.B., 1912.
Raymond, Arthur W., *M.C.*, M.B., 1915.
Reddick, Ward A., M.C.P. & S., 1919.
Rees, Rice, L.S.A., 1902.
Reid, Ferdinand T., L.M.S., 1919.
Reitz, Francis W., M.R.C.S., 1918.
Rellum, Albert R., L.R.C.P. & S., 1921.
Renaud, Joseph H., M.C.P. & S., 1924.
Rennie, Robert, M.B., 1900.
Resnick, Mildred, L.M.S., 1921.
Reubens, Adeline, M.B., 1920.
Rhodes, William F., M.R.C.S., 1909.
Rice, Wm. A., M.B., 1900.
Rich, Evelyn A., L.R.C.P., 1880.
Richards, Eulalia S., L.R.C.P. & S., 1904.
Richards, Franklin C., L.R.C.P. & S., 1904.
Richer, Fernande, M.C.P. & S., 1924.
Riddell, Clarence Eric, M.B., 1923.
Rider, Frederick K., L.S.A., 1892.
Ridout, Constance E., M.R.C.S., 1922.
Riordan, William E., L.R.C.S., 1864.
Robb, Robert McN., M.B., 1906.
Roberts, Charles H., M.R.C.S., 1889.
Roberts, Robert T. F. D., M.B., 1917.
Robertson, Edmund B. de B., L.F.P.S., 1877.
Robertson, Robert, M.B., 1888.
Robins, Henry C., M.B., 1914.
Robinson, Charles St. H., L.R.C.P., 1896.
Robinson, George S., M.R.C.S., 1879.
Rochet, Paul G., M.D., 1915.
Rochfort-Brown, Herbert, M.R.C.S., 1891.
Rogers, George F., M.B., 1893.
Rogers, George P., L.R.C.S., 1879.
Rogers, William H., L.F.P.S., 1862.
Romeo, Natale, M.D., 1908.
Rooney, Patrick J., L.R.C.P. & S., 1906.
Rose-Innes, Arthur, M.R.C.S., 1917.
Roselli, Joseph, M.D., 1920.
Roseman, Hyman S., M.B., 1923.
Rosenau, Albert, L.R.C.P., 1901.
Ross, Alexander, M.R.C.S., 1904.
Ross, Donald M., L.R.C.P., 1903.
Ross, Hervey R., M.C.P. & S., 1917.
Rossiter, Harold T., M.R.C.S., 1908.
Rourke, Joseph M., M.B., 1920.
Row, Frederick E., M.R.C.S., 1881.
Rowell, George B., M.R.C.S., 1887.
Rowlands, Richard P., M.R.C.S., 1906.
Rowthorn, William Henry, L.R.C.P. & S., 1896.
Rusk, John, M.B., 1894.
Russell, John, B.Ch., 1923.
Rutherfoord, Henry T., M.B., 1885.
Rutnam, Alan R., M.R.C.S., 1922.
Ryan, Timothy, J.P., M.B., 1923.
Ryerson, George A. S., L.R.C.P. & S., 1920.
Rygate, Charles D. H., M.R.C.S., 1889.

Sabastian, Thiruchel van, L.R.C.P., 1910.
Sakai, Michio, M.B., 1924.
Salunke, Lakshman S., L.M.S., 1922.
Samarasinghe, Andrew M., L.R.C.P. & S., 1922.
Sampson, Francis C., L.R.C.S., 1863.
Sanderson, Arthur F., M.R.C.S., 1909.
Sanderson, John M., L.S.A., 1898.
Sanderson-Wells, Thomas H., M.B.E., M.R.C.S., 1895.
Sangster, John L., M.R.C.S., 1876.
Saunders, Douglas H., M.B., 1922.
Saundry, James B., M.R.C.S., 1868.
Sawkins, Frederick J. T., M.B., 1914.
Sayers, Max, M.B., 1922.
Scannell, William G., M.B., 1921.
Schapiroff, Abraham, M.R.C.S., 1905.
Schneider, Frank E. E., M.R.C.S., 1924.
Schorn, Alexander O., M.B., 1892.
Scott, David E., M.C.P. & S., 1916.
Sears, Harley A., M.C.P. & S., 1921.
Seelenmeyer, Adolphe F., L.R.C.P., 1885.
Selim, Abd-el-Khalek, M.R.C.S., 1914.
Sen (Miss), Jamini, L.M.S., 1911.
Sen, Parimal C., L.M.S., 1923.
Sen, Praphulla C., M.B., 1924.
Sen, Satindrakumar, M.B., 1920.
Sexton, Joseph P., L.R.C.P. & S., 1892.
Seymour, John N., M.B., 1882.
Seymour, Maurice M., M.C.P. & S., 1921.
Shackleton, Ronald G., M.B., 1924.
Shah, Sayyad H. U., M.B., 1922.
Shakur, Abdus, L.R.C.P., 1921.
Shalaby, Kamel I., M.B., 1917.
Shannon, James W., M.B., 1890.
Sharp, Walter A. R., M.B., 1905.
Sharpe, Frederick G., L.R.C.P. & S., 1901.
Shaw, Alfred E., M.R.C.S., 1892.
Shaw, David le B., L.M.S., 1916.
Shaw, John H., M.B., 1922.
Shaw, Noel F., M.R.C.S., 1922.
Sheldon, Thomas W., M.R.C.S., 1915.
Shenstone, Norman S., L.M.S.S.A., 1909.
Sheridan, John J., M.B., 1921.
Sherwin, John A. H., M.B., 1911.
Shimada, Dennosuke, M.B., 1922.
Shone, Herbert R., M.R.C.S., 1924.
Shorter, Herbert L. A., M.B., 1914.
Shroff, Dadabhoy S., L.R.C.P., 1882.
Shubinsky, Abraham, M.C.P. & S., 1923.
Simpson, Jenny H. A., M.B., 1921.
Sims, George H., M.R.C.S., 1918.
Simson, Colin C., *M.C.*, M.R.C.S., 1898.
Singh, Jaimal, M.B., 1922.
Singh, Jamit, M.S., 1921.
Singleton, Francis E. C., L.R.C.P., 1875.
Sisk, Maurice, M.B., 1895.
Skinner, Robert A., M.R.C.S., 1873.
Smartt, The Hon. Sir Thomas W., K.C.M.G., L.R.C.S., 1878.
Smeeth, Henry G., M.B., 1887.
Smith, Arthur C., M.R.C.S., 1916.
Smith, Arthur H., M.R.C.S., 1891.
Smith, Arthur L., M.D., 1915.
Smith, Edward J., L.S.A., 1883.
Smith (Mrs.), Frances, A.D.M., M.B., 1899.
Smith, George L., L.M.S., 1919.
Smith, Gerald K., M.B., 1911.
Smith, Henry C., M.B., 1924.
Smith, Herbert, M.R.C.S., 1881.
Smith, Issachar R., M.R.C.S., 1914.
Smith, James, M.B., 1911.
Smith, John Edgar, M.B., 1915.
Smith, John Kenneth, M.B., 1914.
Smith, Neville H., M.R.C.S., 1917.
Smith, Newman, L.R.C.P., 1886.
Smith, Wilburn, M.R.C.S., 1911.
Smuts, Phineas A., M.R.C.S., 1917.
Smyth, Joseph, M.D., 1870.
Soares, Alexander D., M.B., 1919.
Somers, James L. E., L.R.C.S., 1883.
Sommerville, Andrew N., M.C.P. & S., 1919.
Sorley, John, M.B., 1881.
Spence, Daniel B., L.S.A., 1893.
Spence, William A. C., L.R.C.P. & S., 1900.
Springthorpe, Annis G. H., M.B., 1924.
Spurgin, Thomas, M.R.C.S., 1879.
Srivastave, Ram S., M.B., 1921.
Stack, Mary J., M.B., 1922.
Stallard, Philip L., M.R.C.S., 1907.
Stanwell, St. John, M.B., 1893.
Staples, Samuel J., M.C.P. & S., 1919.
State, Joseph E., M.C.P. & S., 1922.
Stephen, Clive T., M.B., 1915.
Stephen, Leslie D., M.B., 1909.
Stephens, Frederick G. N., M.B., 1910.
Stephens, Henry J., M.C.P. & S., 1920.
Stephens, James B., M.R.C.S., 1903.
Stevenson, Sir Edmond S., M.R.C.S., 1873.
Stewart, James, L.R.C.S., 1864.
Stewart, William J., M.B., 1913.
Sthamer, Eduard F. A., L.R.C.P., 1903.
Stocker, Charles J., M.R.C.S., 1875.
Stout, Thomas D. M., D.S.O., O.B.E., M.R.C.S., 1910.
Stuart, William W., L.R.C.P. & S., 1904.
Style, Robert G., M.R.C.S., 1882.
Styles, William V. T., M.R.C.S., 1914.
Sutherland, Robert K. S., M.B., 1912.
Sutton, Mordaunt G., M.B., 1919.
Suzor, Jean R., M.B., 1884.
Sweeney, Hugh Vincent, M.B., 1921.
Symons, Henry J. H., *M.C.*, M.R.C.S., 1916.

Taaffe, John F. H., L.S.A., 1883.
Tabone, Leti, M.D., 1924.
Tallack, John R. A., M.B., 1923.
Tallarico, Giuseppe, M.D., 1911.
Tambe, Gangadhar R., M.B., 1914.
Taylor, Adrian H., L.R.C.P. & S., 1873
Taylor, Reginald, M.R.C.S., 1870.
Taylor, William B. B., M.R.C.S., 1900.
Taylor, William K., L.A.H., 1887.
Tebbutt, Arthur H., D.S.O., M.B., 1912.
Ternan, William A. P., L.R.C.P. & S., 1889.
Thapar, Kripal S., M.B., 1921.
Thavara, Mom C., M.R.C.S., 1914.
Thaw, Alfred B., M.B., 1917.
Theunissen, Eugene B., M.B., 1918.
Thomas, Frederick S., M.B., 1922.
Thomas, Frederick V., M.B., 1895.
Thompson, Eustace E., M.C.P. & S., 1924.
Thompson, George M., M.D., 1882.
Thomson (Mrs.), Margaret H. T., L.S.A., 1900.
Thornton, Peter, M.B., 1890.
Thorp, Arthur E., M.R.C.S., 1894.
Tickell, Henry M., M.R.C.S., 1893.
Tidswell, Frank, M.B., 1895.
Tiernan, John, L.F.P.S., 1883.
Tilak, Hari V., M.B., 1920.
Titterton, Herbert C., L.A.H., 1902.
Tiwari, Charan D., M.B., 1921.
Tiwary, Sheo N., M.R.C.S., 1912.
Tolputt, Percy T., L.R.C.P. & S., 1892.
Toombs, Herbert G., M.R.C.S., 1894.
Trackman, Joseph A., M.C.P. & S., 1924.
Tremble, George E., M.C.P. & S., 1924.
Tremble, John, M.B., 1911.
Trist, John R. R., *M.C.*, L.R.C.P., 1905.
Tucker, Clifton E., M.B., 1915.
Turrill, Vernon le V., M.C.P. & S., 1917.

Ullah, Mohammed S., *M.C.*, M.B., 1922.

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Vakil, Burjor P., M.B., 1919.
Valerio, Ismael, M.R.C.S., 1906.
Van Der Merwe, Henry B., M 19.
Van Neuten, Gustave L., M.D., 1920.
Veale, Doris L., M.R.C.S., 1921.
Veitch, John O., M.B., 1895.
Vellema, Douwe M., M.B., 1922.
Vercueil, Leon O., M.B., 1922.
Verge, Cuthbert A., M.B., 1912.
Vickerman, Philip S., O.B.E., M.B., 1905.
Vickers, William H. P., M.B., 1890.
Victory, Jose, M.R.C.S., 1917.
Vincent, George F., L.R.C.P., 1884.
Vorster, Alewyn J., M.B., 1919.
Vosper, Cecil, M.R.C.S., 1905.

Wagner, Philipp F. H., M.B., 1923.
Wales, John F., M.D., 1876.
Walker, Dallas B., M.B., 1919.
Walker, John L., M.R.C.S., 1907.

[*Continued at foot of next page.*

Public Health Services.

SAFEGUARDING OF CERTIFICATION FORMS.

IN a circular addressed to insurance committees the Minister of Health states that cases still come to light in which sickness or disablement benefit has been fraudulently obtained by means of forged medical certificates, the forms having been stolen from practitioners' surgeries. Practitioners are reminded that books of certificate forms should be kept under conditions which will prevent their falling into the hands of unauthorised persons. A warning to this effect is to be printed on the covers of the first batch of certificate books issued to practitioners when they first join the medical list, and on the first batch of books issued to all insurance practitioners at the commencement of each year.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the statistics for 1925 of six county boroughs. Three of them appear in a list in the Brighton report of the 11 densely populated towns of England—viz., West Ham with a density of 64 per acre, Brighton with 53 (without taking the foreshore into account), and East Ham with 43.

Name of county borough.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 birth..	
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Heart disease.	Infant mortality.	Maternal mort. from childbirth.
West Ham ..	318,500	22·0	10·7	1·27	1·12	2·4	1·3	66	2·8
East Ham ..	147,200	17·3	10·2*	1·07	1·36	2·0	1·4	53	3·1
Brighton ..	137,800	15·7	13·4†	1·39	1·72	2·5	1·8	59	3·7
Bournemouth.	85,840	13·5	13·8	1·23	2·08	1·9	2·5	53	4·3
Preston	122,900	17·7	14·5	1·19	1·21	3·2	1·4	131	6·0
Grimsby ..	86,810	20·6	11·0	1·10	1·15	2·1	1·3	71	6·7

* Standardised death-rate 10·6. † Standardised death-rate 11·0.

West Ham.

Dr. F. Garland Collins reports that during the last five years coördination has been established between his department and the ancillary health services in the district and contiguous areas; also a further linking up of maternity and child welfare, tuberculosis and school medical services. He considers that there is one weak link in the chain—namely, the lack of coöperation with the factory medical service. In order to cope with the new legislation respecting milk and meat, two additional officers have been appointed, a veterinary surgeon and a meat inspector. A sanatorium for children suffering from pulmonary tuberculosis has been a long-felt need, and it is proposed to erect accommodation for 40 children on a site on Langdon Hills belonging to the corporation. Other proposals are an open-air swimming bath in West Ham Park and a colony for 500 mental defectives at Ockenden. Dagenham Small-pox Hospital is generally in use as a tuberculosis sanatorium. It had to be cleared in 1920 in order to make room for a small number of small-pox cases. In 1922 the Council arranged with the board of the Orsett Hospital to admit up to 20 cases of small-pox, so as to enable Dagenham Hospital to be in continuous use for tuberculosis, except in the event of a considerable small-pox outbreak. Much building is going on in Dagenham, and its population has increased during the last 5 years from 9127 to 38,000. During 1925 a residential open-air school to accommodate 80 boys was opened at Fyfield, near Ongar, Essex, and the children sent to it have derived remarkable benefit; a day open-air school for 60 girls exists inside the borough. A large shortage of houses still prevails, and a housing scheme for the erection of 152 four-storied tenement flats is now before the Ministry. From 1921 to 1925 the increase of population was 16,140, and the new houses erected numbered only 249. Ninety-six samples of milk were examined bacteriologically, of which 13 contained acid-fast bacilli indistinguishable from the tubercle bacillus. It is stated that "appropriate action" was taken in each case. Apparently the biological test was not used, since "no case of tuberculous cattle came to the notice of the sanitary authority during the year." The prevalence of diphtheria remains high. The fact that it is not wise to delay giving antitoxin until the result of the bacteriological test is known was demonstrated in two of the fatal cases. During the latter part of the year some 15 cases of pemphigus neonatorum occurred. Six of the cases were born in Queen Mary's Hospital, seven were attended by the Plaistow Maternity Charity, and two were in the practice of a midwife. The onset occurred between the fifth and tenth day after birth, with an inflamed lozenge-shaped area in varying situations. The area soon became a blister, which was followed in some cases by many others. Two of the 15 cases died, the eruption having spread over the whole body and become pustulate. No source of infection was established.

East Ham.

Dr. W. Benton expresses his regret that the Council have not increased the staff of health visitors, because it is not now possible to superintend the children between infancy and the school age. The housing shortage is "the one great outstanding defect" of the borough. In the school report a reference is made to the need for improved dental clinic accommodation and for an increased staff. Mr. C. S. Neame, the school dentist, points out that the work is being much hampered, and that according to the Board of Education standard there should be at

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1926.

(*Continued from previous page.*)

Walker, John N., M.R.C.S., 1897.
Walker, John R., M.R.C.S., 1871.
Wall, Alfred E., M.B., 1923.
Wallace, Daisy C., L.M.S.S.A., 1923.
Wallace, Douglas, M.C.P. & S., 1917.
Walsh, Frank B., M.C.P. & S., 1921.
Walsh, John J., L.R.C.P. & S., 1914.
Walsh, Michael V., L.R.C.P. & S., 1913.
Walsh, Vincent G., M.B., 1921.
Ward, Mary D. G., M.B., 1920.
Waters, Robert, C.B., M.D., 1859.
Watson, Harry J., M.C.P. & S., 1920.
Watson, John, M.R.C.S., 1862.
Watson (Mrs.), Mary O., M.B., 1915.
Watson, Samuel E., M.B., 1911.
Watt, James, M.B., 1895.
Weatherhead, John F., L.S.A., 1870.
Webb, John N., M.B., 1919.
Webster, Leonard C., L.R.C.P. & S., 1906.
Weddick, John, L.R.C.P. & S., 1874.
Weinberg, Solomon J., L.R.C.P., 1903.
Weir, Crosbie, L., Med.L.S., 1916.
Weisberg, Arnold, M.B., 1923.
Welply, Alfred, M.B., 1900.
West, David, M.B., 1924.
West (Mrs.), Joan, M.R.C.S., 1917.
Wheeler, Frederic F., M.R.C.S., 1919.
White, Syer B., M.B., 1912.
Whyte, Frederick H., M.B., 1923.
Wicht, Johan F., M.B., 1920.
Wijeyeratne, James De S., M.R.C.S., 1924.
Wilde, Alfred N., M.R.C.S., 1895.
Wilkin, Richard McK., L.R.C.P. & S., 1900.
Wilkin, Thomas J., L.R.C.S., 1867.
Wilkinson, Richard J., M.B., 1899.
Williams, John A. de C., M.B., 1879.
Williams, Neville S., M.R.C.S., 1910.
Wilson, Janette R., M.B., 1921.
Wilson, John S., M.B., 1902.
Wilson, Thomas, M.B., 1902.
Wolfe, Robert I., L.S.A., 1887.
Woods, Henry C., C.B., C.V.O., M.D., 1863.
Woods, John C., L.R.C.P. & S., 1894.
Woods, Lionel D., O.B.E., L.R.C.P. & S., 1907.
Woods, William M., L.R.C.P., 1906.
Woodward, Henry M. M., M.R.C.S., 1904.
Woodyatt, John F., L.R.C.P., 1888.
Wright, Alan G., M.B., 1917.
Wyllie, Hugh A., M.B., 1919.

Yeats, John F., L.R.C.S., 1884.
Yoshinaka, Kogi, M.B., 1922.
Young, David M., M.B., 1917.
Yourell, Fergus D., L.R.C.P. & S., 1918.

Zeederberg, James P., L.R.C.P. & S., 1908.
Zimmerman, Carl J., M.B., 1923.

least four dentists at work in East Ham instead of one as at present. The school ophthalmic surgeon, Mr. C. L. Gimblett, refers to the large number of cases of squint. "This deformity," he says, "results from the poor development of binocular vision in early life, and should be treated at its first appearance—not by waiting until the child is 5 years old." He also emphasises the need in East Ham for a special school for weakly children.

Brighton.

Dr. Duncan Forbes reports that increasing use is being made of X ray examinations for the diagnosis of tubercle. Tuberculin is only used in the form of the Pirquet cuti-reaction for young children. The urochromogen reaction is found of value in excluding hopeless cases from sanatorium treatment. In a small number of cases artificial pneumothorax has proved of great value; ten patients underwent this treatment during the year. The greatest possible use is made of natural sunlight at the sanatorium. During a part of the school hours the children wear sun-bathing costumes, and carry out their drills and organised games in the sunshine under the guidance of the teacher. During the winter months and on sunless days a small open carbon arc lamp has been in use for several years. Provision has also been made at a private light treatment clinic in the town for patients suffering from lupus and tuberculous glands and joints. Dr. Forbes thinks that the results of light treatment are encouraging, but that the claims made for this treatment in some quarters are extravagant. He insists that the crying need for the consumptive is to have work found for him. When gardening was tried at the sanatorium the task allotted to the consumptives was monotonous and no payment was made. The gardener now in charge recognises that the garden is to be run not for beauty or for gain, but to provide work as required for patients; a pocket money allowance of threepence per hour is made. A similar change has been made in the workshop. The manual work was formerly too heavy. Two hundred pounds' worth of electrically driven machinery has been introduced, and also pocket money allowances. These changes have made the patients much more content. Dr. Forbes would like to see the establishment of municipal work treatment centres. An examination of 96 still-births resulted in the finding of the *Spirochæta pallida* in 12 of the livers. The housing scheme of the corporation comprised the erection of 1116 houses, of which 927 were completed at the end of 1925. There are still a number of cases of overcrowding and of subletting without the use of the necessary conveniences. The houses built are sufficient to meet the natural increase of the population, but there is more immigration than emigration in Brighton. Two out of the 33 samples of milk examined for tubercle gave a positive result, but visits paid to the farm failed to discover the tuberculous udders. In each case cows had been sold between the taking of the sample and the obtaining of the result. The by-law for the "humane" slaughter of all animals has been in operation since 1922, during which time nearly 100,000 animals have been slaughtered in the borough. The objections of the trade appear to have been withdrawn. There were three minor shooting accidents to slaughter-men with some of the pistols used, but there have been no accidents since the introduction of the Cash captive bolt pistol, nor at any time with the R.S.P.C.A. cattle killer with free bullet. Dr. Forbes thinks that three principal points should have been borne in mind when the meat regulations of 1924 were framed. First, better meat inspection to prevent the use of carcasses of animals which have suffered from acute illness; secondly, the prevention of the handling of meat by persons who have not washed their hands carefully after defæcation. This second point has been entirely missed by the framers of the regulations. A butcher may have no basin in which to wash his hands after going to the w.c., and may make sausages, serve meat, &c., with dangerously polluted hands. In the circular letter to the retail trade in Brighton with regard to the meat regulations this point is specially emphasised. The third point is that cooked meats are outside the scope of the regulations, although meat which has to be cooked before being eaten is less likely to give rise to trouble than cooked meats.

Bournemouth.

Dr. A. D. Edwards reports that there were only seven notifications of ophthalmia neonatorum. All the cases were mild, but in three instances it was considered advisable to admit mother and child into hospital. Fifty-two milk samples were examined for tubercle, but it is not stated whether the examination was biological, or how many gave a positive result. In the circular issued with regard to the meat regulations an illustration is given of a suggested type of counter case for cooked meats with glass top, shelves, &c., and marble, slate, or hard wood ends. Mr. R. A. Cripps, the public analyst, shows that boric acid is still being freely used for sausages. The new regulations prohibiting this will come into force on Jan. 1st, 1927. Mr. Cripps again draws attention to the unnecessary quantity of rice-flour added to shredded suet. He considers that when a cheap food is added to an expensive one to make it fit for transit, &c., a reasonable limit should be fixed for the proportion of the cheap food to be added. Out of 23 samples of butter and margarine 22 contained boric acid. One sample of butter contained about 37 per cent. of margarine, another of "cooking butter" contained 66 per cent. of margarine, while a margarine sample contained 14 per cent. more butter than the legal maximum of 10 per cent.

Preston.

Dr. F. A. Sharpe points out that the great towns of Lancashire and Cheshire showed a marked increase in infant mortality as compared with 1924. Several had rates over 100, and Preston's rate of 131 was the highest of the 105 great towns of England and Wales. In seeking for an explanation Dr. Sharpe refers to the severe winter, the pollution of the atmosphere by smoke, especially by industrial plants, the three years of severe depression in the textile and engineering trades, and, lastly, the bad housing. The decline in the mortality, resumed during the post-war trade boom, has been stopped by "the four lean years." Dr. Sharpe refers to the large body of opinion in favour of the thesis that the decline in the tuberculosis mortality is more dependent upon a generous supply of food than upon any other factor, and he thinks we must anticipate a continued slight rise until the trade depression lifts. "The heavy loss of life of women at childbirth deserves careful attention. The tendency is in an upward direction. Over 100 women have died in childbirth in the last ten years." Only 73 expectant mothers attended the antenatal centres, but this small number is partly due to the opening of an antenatal clinic at the Preston Royal Infirmary. During the year a concerted effort was made to organise a nursing service available for all classes of society. Hitherto the only nursing available has been a nursing sisterhood for Roman Catholics, a Poor-law nurse, and a nurse maintained by the parish church nursing association. As the result of a public meeting and appeals the Preston and District Nursing Association has been started. The milk samples examined for tubercle numbered 235, and of these 14 were positive. As a result 13 cows with tuberculosis of the udder were removed from the milking herds and slaughtered under supervision. During the inspection of cattle at the abattoir 79 udders were found to be affected with tuberculosis. The majority of these animals were old cows and came from districts outside the area from which milk is drawn for the borough. During May and June an outbreak of scarlet fever, comprising some 40 cases, was traced to infected milk. "Notwithstanding the immense effort made by the corporation and by

private enterprise to supply the deficiency in houses, there is still a very great need," and it has not been possible to proceed with the closure and demolition of insanitary buildings. Preston has a practically stationary population, and the 2075 houses erected since 1911 were more than enough for the slight natural increase of the population . On Jan. 1st, 1926, there were 2000 unsatisfied applicants for new houses.

Grimsby.

Dr. B. C. Stevens reports that the V.D. clinic has been removed from cramped premises in the general hospital to a house acquired by the corporation, and is doing increasingly good work. A new hospital of 24 beds for advanced cases of tuberculosis is nearly ready. There is at present provision for early cases in males, but none for females. For surgical tuberculosis in children four beds in another county are available, but, says Dr. Stevens, "eight of our own would be better." There are, at present, four health visitors, one tuberculosis nurse, and three school nurses. In order to cope with the work adequately, and to avoid overlapping and the visitation in the same house or street by three persons instead of one, Dr. Stevens suggests there should be eight health nurses doing all the necessary visiting, each for her own small district. The scarcity of institution beds for cases of mental deficiency creates a difficult position. The local authority has made good progress with the building of houses, but the overcrowding is not reduced. "Why?" asks Dr. Stevens, "Because no houses are available at a rental of 10*s.* or 12*s.* a week suitable for the casual labourer or the poor." The high maternal mortality emphasises the need for a maternity home. Including two deaths following upon illegal operations and one due to valvular heart disease during the puerperium, the maternal mortality from childbirth was 8·3. The maternity and child welfare medical officer, Dr. Janet Hepburn, conducts an antenatal clinic on one afternoon a week. The number of first attendances during 1925 was 160 (total births, 1792). Particulars were obtained about the feeding of 1167 babies. At three months 61 per cent. were breast fed and at six months 47 per cent.

MENTAL HOSPITAL REPORTS.

THE *Glamorgan County Mental Hospital* at Bridgend had 1833 cases under treatment on Dec. 31st, which means considerable overcrowding. The medical superintendent calculates that only 35 per cent. of the admissions can hope for recovery, although there have been fewer cases of general paralysis. The recovery-rate was 30 per cent. and the death-rate 10·4 per cent; 87 post-mortem examinations were held. There were two deaths from dysentery and seven from severe diarrhœa, which emphasises the need of a properly equipped laboratory; 93 patients are allowed parole and 55 were let out on trial, 12 with money allowances. A cinema and wireless have been installed. There is a consulting surgeon, but no dentist; 105 nurses hold their certificate and 50 more have passed the preliminary examination. Plans are ready for a new admission block, which will be of great value in segregating the patients and reducing congestion. The report includes notes from the three chaplains.

The *Essex and Colchester Mental Hospitals* are at Brentwood and Severalls. At *Brentwood* there were 1661 patients on Dec. 31st. The death-rate was 8·7 per cent. and 112 post-mortem examinations were made. Only 4 per cent. of the deaths were due to pulmonary tuberculosis, which is now but little in evidence. There was one case of dysentery. A very large proportion of the admissions were general paralytics, and for these malarial treatment is to be tried. In the admission wards a clinical and examination room has been provided, but there are still no facilities for hydrotherapy. The dentists attend twice weekly. Fifty-two patients are allowed parole and there are open wards. On the female side there is a weaving and handicraft room which occupies over 40 women. An operating theatre, a general bathroom, new verandahs, and hot water installation have been completed. Sixty-six nurses hold their certificate. There are a number of imbecile boys in the hospital, and these now have two small rooms to themselves. At *Severalls* there were 1669 patients. The low death-rate of 5·5 per cent. was a record for the hospital, and there has been no dysentery for two years. Post-mortem examinations were held in 85 per cent. of the deaths. General paralysis is being treated by malaria; 122 patients were allowed out on trial, 49 having money allowances, while over 200 patients have parole within the estate, and three beyond. The poultry farm is developing satisfactorily. There is a small weaving-room, but more space is required for this industry. The pathological laboratory is being enlarged, and the work done therein includes routine investigations of blood and cerebro-spinal fluid, the exploration of new tests for general paralysis, and routine examination for typhoid carriers, which has resulted in the discovery of six. Ninety-six nurses now hold their certificate, and the supply of suitable candidates is greater than it was.

The *City of Leicester Mental Hospital* at West Humberstone had 898 inmates on March 31st. The death-rate was 9·1 per cent. and the recovery-rate 41·1 per cent. The cause of death was verified in 75·3 per cent. of the cases. The visiting commissioners remark that "the general atmosphere of the hospital was one of happiness and goodwill"; 77 per cent. of the patients are usefully employed and the medical superintendent urges the appointment of an occupation officer, remarking very rightly that the equipment of a mental nurse should include a knowledge of how to make useful occupation for her cases. 47 per cent. of the male and 36 per cent. of the female patients are on parole, and leave of absence has been granted 1395 times during the year. A magazine, entirely produced by patients, has been widely circulated. The pathologist submits his first report this year and records a small outbreak of dysentery, after which two carriers were discovered. The question of carriers is being investigated. An outbreak of ringworm drew attention to the possibility of this disease being more common in mental hospitals than is realised. Malarial treatment was given to seven cases of general paralysis and to three of neurosyphilis. Only one case showed improvement. The dental surgeon reports that he has seen over 300 patients, and that all new admissions have also been examined. While patients are under his care they undergo at the same time a course of oral hygiene in the wards, a most important adjunct to dental work. He states that he is now seeing infinitely cleaner mouths than before. Thirty-six nurses are certificated and three have the M.P.A. diploma.

The *Monmouthshire Mental Hospital* at Abergavenny houses 1167 patients and has 37 vacancies. The death-rate was 6·4 per cent., and the cause was verified post mortem in 77 per cent. of these. There was an influenza epidemic and one case of dysentery, but otherwise the health of the patients was good. The recovery-rate was 26·9 per cent., but many of the admissions were feeble or infirm and there was a high proportion of general paralytics. All the sewing work of the hospital is done in the wards, and boots are both repaired and made. The detached houses and two wards are administered on the open door system, and parole is allowed to over 100 patients within the grounds and 31 outside. Shopping parties visit the town weekly. A dentist attends weekly, and the appointment of a visiting surgeon is recommended by the commissioners During the year 11 nurses obtained their final certificate. The report includes notes from the three chaplains.

The *James Murray's Royal Asylum* at Perth had 163 patients on its register on March 31st, having had the largest number of admissions during the year on record, amounting to 55·5 per cent. of the average inhabitants. Just under 60 per cent. were voluntary boarders and the authorities have found no difficulty

in persuading these people to stay as long as required. A few certified patients are allowed out on probation. The report includes no statistical tables. The medical superintendent points out that the bodily health of patients admitted is generally poor, and discusses the relationship of pyorrhœa to mental disorder. In some cases eradication of deeply-placed septic foci led to rapid improvement, but in others the results of drastic dental treatment were disappointing. The death-rate was 9·3 per cent. and post-mortem examinations were made in 10 out of the 14 fatal cases. There were four cases of German measles, but no more serious epidemic. As is the custom here, every available nurses at for the certificate examination of the Nursing Association.

The *West Sussex County Mental Hospital* at Chichester has 759 patients, and although not immediately pressed for accommodation, has approached two boards of guardians to see if they will receive quiet aged patients in their infirmaries. The death-rate was 4·7 per cent. and post-mortems were held in 78 per cent. of cases. A number of relieved patients have been sent out on trial, eight of them with money allowances. Parole has been granted to 60 patients, and 14 per cent. of the women wear their own clothes. There was an epidemic of influenza, but otherwise the health has been good. Individual attention is given in the kitchen to recovering patients who show any aptitude for cooking. The excellent X ray apparatus is at present housed in a temporary hut. 70 per cent. of the male and 50 per cent. of the female nurses are certificated or registered.

The *Croydon Mental Hospital* at Warlingham had 713 residents on March 31st, and the recovery-rate for the year reached 52·38 per cent., 19 per cent. higher than the average figure for county hospitals. Accommodation has been taxed to the utmost. The death-rate was 6·45 per cent. The general health was good; there was only one case of dysentery. The hospital has electrotherapeutic and X ray plant, and a new bacteriological laboratory is being fitted up. A dentist attends weekly. Malarial treatment has proved satisfactory for general paralysis, 50 per cent. of the cases being discharged and continuing well. A large proportion of the patients are usefully employed in various domestic offices and in mat-making. The numbers out on trial are, however, still not great. Twelve nurses have the M.P.A. certificate and 13 more have passed the preliminary. The three chaplains each supply a note to the report.

The *Hertfordshire County Mental Hospital* at St. Albans accommodates 904 cases and has an excess of beds, many of which are, however, occupied by out-county patients. A three-valve wireless set, four pianos, and a billiard table have been added. The report makes the important announcement that the committee have arranged to allocate an area of 130 acres of the estate for a mental deficiency institution. The death-rate was 6·5 per cent., post-mortem examinations being held on 49 cases out of the 59 who died. The recovery-rate was 40·8 per cent., an increase on the previous year. There was one case of diphtheria and one of enteric fever. The male sick patients are successfully nursed by women. The dentist treated 123 patients, and there were several major operations during the year. One ward has been made "open." Thirty-seven nurses have their certificate, while 22 others have passed the preliminary examination.

The *Brighton County Borough Mental Hospital* at Hayward's Heath had 828 cases in residence on Dec. 31st. There has been no dysentery since 1924 and no epidemic disease save one case of mumps. Full parole has been given to 47 patients, without untoward result. The recovery-rate was 57·3 per cent. for males and 39·5 per cent. for females. A wireless set has been fixed and electricity is being installed. Forty-three nurses hold their certificate and 24 more have passed the preliminary test. The chaplain and dentist also present reports; the latter attended 435 patients. Last year a dressmaker was appointed to supervise the making of the women's clothes and to make an attempt to get away from stereotyped patterns. Unfortunately, there is no admission ward and new cases have to be treated amongst the chronics. There is a possibility that an out-patient clinic may be started in Brighton; it is to be hoped that this important venture will mature successfully.

The *Kingseat Mental Hospital*, Aberdeen, had 628 patients at the end of the year, an increase of nine. It is still in the unfortunate position of having to refuse voluntary patients because the parish council receive a small grant for certified cases. The medical superintendent justifiably complains of this reactionary and obstructive policy. There was a recovery-rate of 38 per cent. and a death-rate of 6·8 per cent. As there was continual diphtheria and scarlet fever in the district the patients and staff were tested and "positives" immunised, and since then there have been no cases of epidemic disease. The hospital has long been overcrowded and mental defectives have been treated in association with other patients. In addition to its prejudicial effect on the patients, this also makes the nursing more difficult and discourages the staff. All will welcome the relief afforded by the new villas, which will soon be ready for use.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 28TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 90 (last week 62); scarlet fever, 1056; diphtheria, 725; enteric fever, 59; pneumonia, 361; puerperal fever, 42; cerebro-spinal fever, 11; acute poliomyelitis, 40; acute polio-encephalitis, 2; encephalitis lethargica, 39; continued fever, 1; dysentery, 11; ophthalmia neonatorum, 104. There were no cases of cholera or typhus fever notified during this week. The case of bubonic plague at Liverpool will come into next week's return.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 2 (0) from enteric fever, 10 (0) from measles, 5 (2) from scarlet fever, 31 (6) from whooping-cough, 24 (6) from diphtheria, 124 (23) from diarrhœa and enteritis under 2 years of age, and 18 (4) from influenza. The returns from diarrhœa and enteritis, although showing a rise of about 25 per cent. on the figures of the previous week, are not much more than one-half the figures of the corresponding week a year ago. The figures in parentheses are those for London itself.

A CASE OF BUBONIC PLAGUE IN LIVERPOOL.—In the case of a boy of 10, who became ill on August 27th and died in hospital on August 30th, the diagnosis of plague has been confirmed by the bacteriologist of the Ministry of Health. The boy's father, a dock employee, is himself in hospital recovering from an illness the symptoms of which are suggestive that he, too, may have suffered from plague. The remaining members of the household are under supervision and steps to prevent the spread of infection are being taken by the Liverpool Public Health Department.

TREATMENT OF TUBERCULOUS INSURED PERSONS IN IRELAND.—At the meeting of the National Association of Insurance Committees in Dublin last week a discussion was held on the treatment of tuberculous insured persons. It has been the experience of many committees that the sanatorium fund is insufficient for the adequate treatment of all tuberculous insured persons. On the other hand, the local authorities were unwilling to undertake the treatment of insured persons in excess of the number for whom payment could be made by the insurance committees. A deputation from the Association recently waited on Dr. E. Stephenson, chief medical officer of the Department of Local Government and Public Health, and stated that the insufficiency of the sanatorium benefit fund was largely due to non-compliance with the Insurance Acts, and suggested that the Government should meet its moral obligations to insured people who had complied with the Acts. Dr. Stephenson, in reply, admitted the hardship for insured persons, but said that his Department was concerned to safeguard the ratepayers. If the deputation submitted their views in the form of a memorandum he would submit it to the Minister.

Correspondence.

"Audi alteram partem."

HELIOTHERAPY IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I was greatly interested to see the article by Dr. J. E. Wood on this subject in your issue of August 21st. There appears to be a dread of employing sunshine in pulmonary tuberculosis, in spite of its recognised value in other forms of the disease. This fear would seem to be very largely hypothetical. In January of this year Dr. Rollier very kindly showed me a large number of cases in his wonderful clinics at Leysin. I asked him particularly about the effect of sunshine in pulmonary tuberculosis. He replied that he was a surgeon and not a physician, and did not deal with pulmonary cases except where so-called surgical and pulmonary tuberculosis coexisted. In such cases he gave full sunshine treatment, with apparently excellent results. I examined these cases and was very favourably impressed by them. Disease that was presumed to be hilum tuberculosis was treated as a routine by heliotherapy, and the cases did exceedingly well. Dr. Rollier constantly pointed out that sunshine treatment failed to cure where there was a mixed infection without free drainage. This condition, of course, obtains in many cases of phthisis. But, after prolonged fresh air treatment the mixed infection is frequently overcome, and then sunshine treatment would be indicated. I have often wondered whether it would be possible to drain a cavity exteriorly where the pleura is adherent, if one large cavity was keeping up the mixed infection, and then to give sunshine treatment. Heliotherapy, it would seem, would be indicated after thoracoplasty, apicolysis, and other surgical procedures where the collapse of the diseased part has presumably minimised the mixed infection. One hears much talk of severe reactions following exposure to sunshine. This, however, is the same with surgical tuberculosis. If the diseased part is irradiated too soon, or too much, a devastating reaction may occur. This is avoided by following Rollier's technique exactly. So would it be, I imagine, with phthisis, if the diseased part were only gradually approached and finally exposed cautiously, watching carefully any reaction until it was safe to give prolonged exposures. I earnestly hope that an extended trial will be made of heliotherapy in pulmonary tuberculosis.

I am, Sir, yours faithfully,

F. G. CHANDLER, M.D., F.R.C.P.

London, N.W., August 30th, 1926.

THE TECHNIQUE OF BLOOD TRANSFUSION.

To the Editor of THE LANCET.

SIR,—Mr. Keynes made a noteworthy improvement in the apparatus for transfusion of blood, but in using it I found certain disadvantages which it seemed impossible to obviate. Mr. Keynes without making trial of the modifications I have suggested criticises and condemns them. The crucial point is whether or not the risk of contamination is merely academic. I would maintain that for the purposes in view, involving repeated transfusions carried out in the ward or in the private house, this risk is not negligible. The liability to clotting is largely dependent upon the modifications introduced to prevent contamination. But even when using Keynes's method of collecting the blood, clotting does take place occasionally both in the tube and in the needle. It is not so much a question of the rate of flow, as Mr. Keynes suggests, as of its intermittency, and this is beyond the control of the operator. I must confess that it is astonishing to me that Mr. Keynes in the course of his eight years' experience has not met with this difficulty. It would be interesting to have the experience of others. His assertion that clotting in the needle cannot be prevented by using the apparatus in question is only worth consideration if it is founded on experience.

As regards the toxicity of the dose of citrate that I mentioned, I can only say that my results bear out the opinion of Lewisohn, as quoted by Mr. Keynes in his monograph on Blood Transfusion, that 5 g. of sodium citrate is innocuous to man. But I am surprised that it did not occur to Mr. Keynes that in using my method he can use whatever concentration of citrate he likes. He himself has pointed out that the tonicity of the solution is a matter of little importance. Incidentally, it is another advantage of my method that the amount of citrate used can be accurately regulated to the amount of blood actually withdrawn. The elaborateness of the apparatus is more apparent than real. I have myself collected 400 c.cm. of blood without assistance.

I am, Sir, yours faithfully,

London Hospital, Sept. 6th, 1926. PAUL C. GIBSON.

To the Editor of THE LANCET.

SIR,—It is obviously desirable that the technique of so important a therapeutic measure as blood transfusion should be made as perfect and fool-proof as possible. Dr. Gibson attempts to improve the citrate method introduced by Mr. Geoffrey Keynes. His only objections to this method are: first, that it does not eliminate the clotting difficulty; and, secondly, that the open method of collection is used which carries with it the risk of contaminating the blood.

In my experience, when one has mastered the technique of the Keynes method, the clotting difficulty does not exist; while to avoid contaminating the blood during collection an elaborate complication such as that described is unnecessary. A plug of cotton-wool is effective; or, if suction is used, as I believe it may be with advantage, a rubber stopper fitted with an inlet tube prevents infective material falling into the flask.

I would suggest that the Keynes method, except for minor unessential modifications, as a citrate method, is incapable of improvement. While acknowledging much valuable practical advice in Dr. Gibson's paper, I feel it regrettable that he has not applied his obvious ingenuity to effect some improvement in the methods which badly need it—namely, those for administering whole blood without addition of anti-coagulants.

Blood transfusion in the treatment of medical diseases may not have achieved the brilliant results commonly obtained in surgical cases; but to conclude that "it is at any rate desirable that the remedy should be given a careful and exhaustive trial before it is decided finally to abandon it" is a singularly pessimistic view, suggesting that Dr. Gibson so far has not found his results commensurate with the technical labour expended.

I am, Sir, yours faithfully,

KENNETH STONE.

Harley-street, W., August 31st, 1926.

AN UNUSUAL DISABILITY.

To the Editor of THE LANCET.

SIR,—I recently examined a man with a complete ankylosis of the left hip and in which the left knee was involved. His chief complaint was that, although he could fully undress himself when going to bed at night, he required help to dress himself in the morning. At first sight this did not appear quite clear and it required an actual demonstration to prove it. He was unable to reach his left foot with either hand. He wore shoes and by using his right foot was able to remove the left shoe, and he was able to remove the left sock by means of his right toes. He may in time to able to educate the toes of the right foot to complete his morning toilet unaided, but this at present appears an impossibility.—I am, Sir, yours faithfully,

J. J. SCANLAN.

Old Broad-street, London, E.C., Sept. 6th, 1926.

THE CARDIAC CIRCULATION AND DISEASE.

To the Editor of THE LANCET.

SIR,—In his valuable paper in your last issue Dr. Geoffrey Bourne states that an agency that could reduce the frequency of the heart-beat like digitalis would be of great therapeutic value. May I remind your readers that, as has been long ago and repeatedly pointed out by good observers, we have such an agency in *cold?* In acute disease the heart is singularly responsive to local applications of cold, and the vicious circle of threatening heart failure may often be broken thereby. In chronic conditions of rapid heart from myocardial weakness, cooling (but not "hot") baths of various kinds may similarly be relied upon to increase the force and diminish the frequency of the pulse.

The relation between the diastole and the nutrition of the heart is an interesting one, and Dr. Bourne's view agrees with the observation that many persons with feeble but slow hearts are long lived. It may be noted that cold applied to the precordium during hot baths and applications often prevents acceleration of the heart. This method, known at Pistyan as "heart-cooling," enables thermal treatment to be used in many cases of debility, "rheumatic" and other.

I am, Sir, yours faithfully,

London, Sept. 6th, 1926. R. FORTESCUE FOX.

PASTEURISATION OF MILK.

To the Editor of THE LANCET.

SIR,—It is a wholesome sign of the times when someone like Mr. McLachlan does not fear to take his stand against the sophistication or doctoring of natural food. Many years ago I had a hard fight in an English residential town—Cheltenham—to kill the trade of selling sterilised milk; now, I have not the least doubt but that 90 per cent. of a section of the population of that town alone would have been rickety had this section's mothers not had the good sense to be impressed by my simple reasoning: "What nourishment is the little one having?"—the little one being the picture of pre-rachitic hæmic impoverishment. "Cow's milk," was the reply. "Cow's milk, boiled or sterilised." "Why?" "I thought it killed the germs." "Is a mother's milk boiled or sterilised?" That settled the doom of the laboratory worker's advice. The true test of a food was, and is, the effect on the nutrition and development and strength of the consumer; and the wise man was the one who foresaw what would happen to the consumer in 10 or 12 years. My experience is that the laboratory worker has never done this. Pasteurised milk has, and will have, the same deplorable results as boiled or sterilised milk, because, and this is the all-important point, *it is cooked.* Anyone can perform the following experiment: Place an egg in water for 30 minutes at the temperature of 145° F. and the result is *a cooked egg;* and do not pasteurisers frequently proudly say that they hold the milk at 150°, *or thereabouts,* for half an hour? The nutritional, developmental, and sthenic value of milk is destroyed by pasteurising; and it does not need much prevision to know that rickets and its congeners are in the future to wreck or to ruin the health of the young.

No one is much to blame, and least of all the parents, but anyone who has studiously observed, over a series of years, the lamentable effect of feeding anyone on sophisticated or doctored milk can only be doing a public duty by persisting in pointing out the destructive effects on the growing body organism—deformity and maldevelopment, asthenia, predisposition to disease, and inability to withstand any morbid process. In effect, the same condition results to a food from pasteurising as from the use of a preservative such as boric acid; there is devitalising of organismal life—i.e., of bacterial life—not destruction, and there is devitalising of the cellular life of the food itself. Now, surely, mothers, educated doctors—i.e., those who have jettisoned much of the impedimenta of their schooling—and laboratory workers all know the baneful results of boric acid and other similar preservatives on foodstuffs, whether for the child or the adult.

I am, Sir, yours faithfully,

R. CUNNINGHAM AFFLECK.

Edinburgh, August 27th, 1926.

NOMENCLATURE OF ABNORMAL UTERINE HÆMORRHAGE.

To the Editor of THE LANCET.

SIR,—I am interested in Prof. Blair Bell's criticisms in your last issue of the nomenclature suggested and approved at the Nottingham meeting of the B.M.A. for the varieties of abnormal uterine hæmorrhage, and I welcome this opportunity of clearing up any doubts that may still exist in his mind and in those of others. I am indeed sorry that illness prevented him from being present at the discussion in question which, if it has done nothing else, has served to focus attention once more upon the urgent necessity for standardising a nomenclature in connexion with this subject. I do not claim on this occasion to have put forward anything new in the matter of terminology. What I did attempt to "propound," if this word must be used, was a pathological basis to substantiate terms which are already in use. Mere names to cover symptoms do not appear to have much value unless they are backed up by pathological facts.

The nomenclature I used in my paper at Nottingham is practically the same as that employed by me in my article on Uterine Hæmorrhage in the "Practitioner's Encyclopædia of Obstetrics and Gynæcology" (Fairbairn), published in 1921. Here Prof. Bell will find that full credit is accorded to him as regards the word "epimenorrhœa." "Menostaxis" was a term introduced by me in 1921 to designate a prolonged "period" and which has, as a pathological basis, a patchy necrosis of the endometrium. It is, in other words, an incomplete menstrual abortion, and is a distinct entity. "Menorrhagia," in the sense in which I employ and teach the term, is a short, sharp hæmorrhage due to atonicity of the uterus, probably with a neuro-muscular basis. It is analogous to post-partum hæmorrhage. Both "menorrhagia" and "metrostaxis" are terms that have long been in use, and neither Prof. Bell nor I lay claim to any originality in the matter. Prof. Bell complains that in the classification accepted at Nottingham no reference is made to his term "epimenorrhagia." I did not include it because candidly I could not see the necessity for it. As I understand the word it means too frequent and too excessive periods. It has no definite pathological basis apart from what is included under the other names, and to my mind is mere hair-splitting. One of the great difficulties in investigating uterine hæmorrhage from a clinical standpoint is that not only two but sometimes three of the standardised varieties may and do occur together. If each one of these numerous possible combinations is to be honoured with the dignity of a name such as "epimenorrhagia," an algebraical and pathological problem is set which I am only too pleased to leave to Prof. Bell to elucidate.

The Nottingham classification of uterine hæmorrhage is at least based upon pathology in addition to symptomatology, and it has the merit of fact in addition to theory. From a practical standpoint, therefore, the matter amounts to this—the old terms of "menorrhagia" and "metrostaxis" are retained with the limitations noted in my opening paper; the comparatively new terms "epimenorrhœa" and "menostaxis" are introduced to designate specific pathological types of bleeding, and the name "epimenorrhagia" is dropped as being redundant. In this "new" terminology what is good of the old has been retained and, of the new, I think the honours stand even.

I am, Sir, yours faithfully,

BECKWITH WHITEHOUSE.

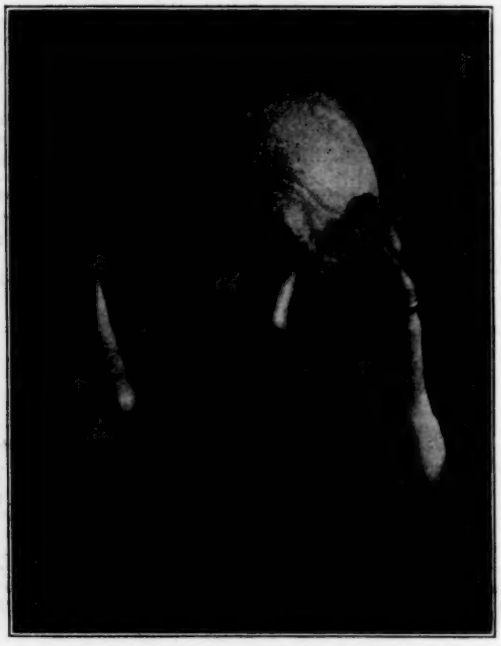
Birmingham, Sept. 4th, 1926.

Obituary.

J. HOWARD MUMMERY, C.B.E., D.Sc. PENN., F.R.C.S. ENG., L.D.S.

WE regret to announce the death at the age of 79 of Mr. J. Howard Mummery, who had for many years been a recognised leader of the dental profession not only in this country but among pathologists in every scientific centre.

Mummery was the son of a distinguished scientist and dentist, J. R. Mummery, who was one of the first to investigate the incidence of dental caries among different races and whose work is still quoted as authoritative. He was educated privately and received his medical training at University College Hospital, where he early commenced work as a microscopist and started investigations in the difficult field of dental histology which he was pursuing within a few weeks of his death.



J. HOWARD MUMMERY.

As a histologist Mummery's ability can have been equalled by few and rarely excelled. The dental tissues present so many technical difficulties that the investigation of their minute structure calls for exceptional skill and patience. In this work he was supreme, and his additions to our knowledge of the normal and morbid structure of the teeth have played a great part in creating a scientific conception of dental disease and its treatment. Dental anatomy plays an important part in zoology, so that his labours were appreciated not only by dentists but by all biologists and anthropologists. He was among the first to describe adequately the development of dentine, and his account, written as far back as 1892, is still generally accepted. His best-known piece of research was that on the innervation of the highly sensitive dentine. Since the dental pulp is richly supplied with nerve-fibres, it would seem natural to suppose that these eventually enter the tubes of the dentine. For many years histologists sought to demonstrate this point but without success, for the technical difficulties of preparing sections to show a hard tissue like dentine and a delicate tissue like the pulp in their anatomical relation without distortion were extremely great. Mummery took up the problem and laboured at it long and unceasingly, and eventually after work, the magnitude of which only a few of his friends realised, he was able to demonstrate that the nerve-fibres passed into the dentinal tubes. His results were published in the *Philosophical Transactions* of the Royal Society, and attracted widespread attention and some criticism, not all of which was either fair or pertinent. On the whole, it may be said that histologists generally, and not only those engaged in dental research, have accepted Mummery's conclusions.

Among Mummery's other important contributions to dental pathology may be mentioned an inquiry into the various forms of inflammation of the pulp and the morbid anatomy of the odontomata, but indeed there are few branches of dental science to which he did not make additions of first-rate importance. As a worker he was painstaking and exact, and nothing but the best that he could do satisfied him. Were he studying any point in dental histology he would cut scores of sections before he could come to any conclusions that he would publish or depend upon, and would remorselessly scrap sections that many would have been proud to have prepared. As a result his various papers possess high value, and his conclusions as to the structure of the dental tissues have been generally upheld by subsequent workers. Nor was he merely a technician of great skill; he was a vigorous and clear thinker, with a wide knowledge of general anatomy and pathology which he brought to bear on the various dental problems that occupied his attention. His unwillingness to publish anything until he was sure of his ground is exemplified by the fact that at the age of 72 he published his first and only book, the "Microscopic Anatomy of the Teeth," and it was at once hailed as a highly original and important work. A second edition was soon called for, and Mummery took the opportunity of adding a section on comparative anatomy which made this edition almost a fresh publication. The book, like the manual of John and Charles Tomes, is already a classic in its own domain.

Mummery retained his mental vigour unimpaired to the end and was engaged in active research up to within a few weeks ago. It is not given to many men to add substantially to their fame after the age of 70, but Mummery did so, and in many respects the last decade of his life was the most fruitful. A serious illness a year ago, from which he made a rather remarkable recovery, impaired his strength considerably, but his brain was as alert as ever, and though he tired more easily his hand lost none of its skill. Within the last three months three papers of histological research, all of first-rate importance, were written by him and have been published. A correspondent who worked with Mummery often during the last few years records it as an inspiring sight to watch this passionate devotion to knowledge, sometimes checked but never stopped by the diminution of the physical powers. "Mummery in private life," he adds, "was a charming companion, humorous, widely read, and with many artistic interests. He was, moreover, one of the kindest of men and loved nothing better than to place his great knowledge at the disposal of others. Indeed, he was almost prodigal of his time in helping younger men. Though few of his contemporaries survive, yet he kept on adding to his friends, for he was always prepared to receive new ideas, and up to the end retained an elasticity of outlook that was positively youthful."

Mummery received the C.B.E. for his services during the war in connexion with the treatment of injuries of the jaws; the University of Pennsylvania conferred on him the D.Sc. in recognition of his general services to dental science; and the Royal College of Surgeons of England made him an honorary Fellow. He was a member of the committee for the investigation of dental disease of the Medical Research Council and carried out useful researches for that body. He was one of the few dentists whose reputation was international, and his death is a loss to the medical profession which he served with such keenness and genius.

SAMUEL ARTHUR POWELL, O.B.E., M.D. BELF., M.Ch. R.U.I., J.P., V.D.,

LIEUT.-COLONEL IN CHARGE OF OFFICERS' HOSPITAL, BOMBAY.

THE death occurred on August 28th of Dr. S. A. Powell after a short illness. "Dick" Powell was born at Bandon, co. Cork, in 1864; was educated at Trinity College, Dublin, the Royal University of Ireland, and Belfast. He qualified M.B. R.U.I. in 1887 and M.Ch. the same year. A brilliant surgical future was expected of him, but he was attracted away from Belfast to the more adventurous life offered by a civilian post in Assam. Here he became interested in field observation, and did some valuable laboratory work on obscure problems of tropical disease before he again changed his work for that of a police surgeon in Calcutta. When the South African war broke out Powell became medical officer to Lumsden's Horse, being frequently mentioned in despatches, but after that war returned to India as police surgeon in Bombay. He gained considerable experience in toxicology and medico-legal matters, and was appointed to the Professorship of Jurisprudence in Grant Medical College, Bombay; some of his work is incorporated in chapters of Lyon's Medical Jurisprudence. As a lecturer he was lucid and incisive, interesting Indian students because he understood their standpoint and appreciated their difficulties in acquiring knowledge given in a language not their own. He also acted as professor of biology; his lectures were chosen carefully and illustrated by native types of plants and animals, not imported specimens from Europe. His Practical Biology for Indian Students has been through many editions, and remains a model of how to apply general knowledge to local conditions. Dr. Powell was examiner to the Punjab and Allahabad Universities, and held other academic posts. In the Senate of the Bombay University his local knowledge enabled him to reconcile conflicting opinions, and his incisive and ready wit outmanœuvred obstruction. When the Great War began Dr. Powell was in Germany, but was able to get back to Bombay, and worked from 1915 to 1919 as Lieut-Colonel I.D.F., commanding the Byculla Officers' Hospital. The strain of the war affected his health and he was compelled to leave India. After a time he took up consulting work in tropical diseases in London, contributing several papers to the Royal Society of Medicine and the Royal Society of Tropical Medicine. He acted as consulting physician on tropical diseases to the Ministry of Pensions.

Powell was above all a clubable man. He was popular with all classes and races in India and had many hobbies. In his early days in Assam he ran a training stable for a time and rode his own horses. His sympathetic understanding of the Indian people enabled him to clear away many misunderstandings, and he had an intimate personal knowledge of the criminal classes that lent point and humour to his lectures on medical jurisprudence. Many of his old pupils in India will regret to learn of his death.

CECIL JOHN DAVENPORT, F.R.C.S. ENG., L.R.C.P. LOND.

ON Sept. 4th Mr. C. J. Davenport died suddenly in Shanghai at the age of 63. Mr. Davenport was born in Adelaide, South Australia, and came to England to study medicine at St. Bartholomew's Hospital, where he qualified M.R.C.S., L.R.C.P. in 1887, taking the F.R.C.S. Eng. in 1889. After holding resident posts at his teaching hospital, he proceeded to China in 1889 under the auspices of the London Missionary Society and established a medical mission in Chungking. After some years of pioneer work there he was moved to Wuchang, where he carried on the medical work till invalided home at the time of the Boxer rising. In 1905 he was appointed medical superintendent of the Chinese Hospital, Shantung-road, Shanghai—the post he held till his death. Originally a mission hospital, but under the control of local committees, in 1905 the hospital was in low straits from lack of qualified staff. Under Mr. Davenport's superintendence it has risen to a high standard of efficiency, many thousands of poor Chinese being treated yearly in the wards and out-patient departments, and many doctors and nurses being trained. Recently a sum of over £300,000 was left by the late Mr. H. Lester, of Shanghai, for its development and endowment, and though Mr. Davenport's retirement had previously been planned to take effect next year, he was being pressed to remain in Shanghai and give his advice and help in the administration of the benefaction for the hospital and its proposed medical school. The extent of his administrative duties had forced him to give up much of his surgical work, to his lasting regret. Mr. Davenport's sudden death is a severe loss to the local community, where his judgment and vision were widely appreciated. He had no wish for personal advancement or distinction, but as a president of the China Medical Missionary Association and the recipient of a decoration from the Chinese Government he was shown some formal recognition in recent years. Mr. Davenport's life was given up entirely to the forwarding of his work; his keenness, upright character, and kindliness endeared him to the many of all nationalities with whom he was brought into contact. The chaotic state of the China he loved and the events of the past few years were causes of much anxiety and grief to him, but his efforts to improve the conditions of medical work in that country were maintained to the end. He married in 1890 Miss Miles, who prior to the marriage was Sister Martha at St. Bartholomew's Hospital, and was one of the first fully trained British nurses to go to China. He had two daughters and a son, Robert Cecil, who is in practice as an ophthalmic surgeon in London.

CENTENARY OF COOMBE LYING-IN HOSPITAL, DUBLIN.

As already announced, the Coombe Lying-in Hospital is celebrating its hundredth anniversary from Tuesday, Sept. 14th, to Friday, Sept. 17th. The proceedings will open with a reception at the Royal College of Surgeons by the Governors of the Hospital on Tuesday, at 8.15 P.M. On the following day the centenary congress will be opened by its President, Sir William Smyly, at the Royal College of Surgeons, at 9.30 A.M. A paper on Obstetrical Teaching in Sweden, by Prof. Essen Möller, will be followed by a discussion in which Prof. A. Couvelaire, of Paris, Prof. Munro Kerr, Dr. L. Cassidy, Prof. Fletcher Shaw, and Mr. Comyns Berkeley are expected to take part. At 11.15 Prof. J. P. Faure, of Paris, will show a film illustrating abdominal hysterectomy, and the rest of the morning will be devoted to papers on the Unnecessary Induction of Labour, by Mr. Eardley Holland, and the Treatment of Climacteric Hæmorrhages, by Prof. Paul Werner, of Vienna. In the afternoon the Coombe Hospital will be on view, and in the evening there will be a dinner at the College of Surgeons. On Wednesday the opening paper will be read by Prof. Munro Kerr, on the Lower Uterine Segment Cæsarean Section Operation. Prof. J. B. de Lee, of Chicago, Prof. Möller, Mr. Eardley Holland, and Prof. Werner will join in the discussion. The remaining subjects of papers to be read on Wednesday are Two Important Advances in the Practice of Obstetrics and Gynæcology (Prof. A. Donald), Three Obstetrical Principles (Prof. de Lee), and Some Problems in Antenatal Diagnosis and Prognosis (Prof. Louise McIlroy). In the afternoon there will be a polo match in Phœnix Park between Coombe Hospital and the All-Ireland Polo Club, and in the evening a special performance by the Abbey Theatre Company. On Friday the proceedings are to open with a paper on Eclampsia, by Prof. H. Hinselmann, of Altona; this will be discussed by Mr. Eardley Holland, Dr. J. Hendry, Dr. Hugh Davidson, and Dr. Gibbon FitzGibbon, amongst others. Papers will be read by Dr. R. W. Johnstone on the Early Diagnosis of Cancer, by Prof. Beckwith Whitehouse, one on the Cause of Menstrual Pain, and by Prof. F. J. Browne on Intranatal Infection in the Newly Born. From 4–6 P.M. there will be a garden party in the Zoological Gardens. Anyone wishing to take part in the discussions or the various functions should write to the hon. secretary, Dr. L. Cassidy, at 6, Kildare-street, Dublin, who will be pleased to send programmes and cards of invitation.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified:—Surg. Comdrs.: F. G. H. R. Black to *Victory*, for R.N. Hospl., Haslar, temp., supy.; H. H. Babington, loan to R.A.N. cancelled; G. G. Vickery to Canterbury (on transfer); J. A. Maxwell to *Pembroke* for R.N. Hospital, Great Yarmouth (temp.); J. Bourdas to *Furious* (on recommg.); A. G. V. French to *Malaya*, and to *Malaya* (on recommg.); and H. M. Whelan to *Ganges* for R.N. Sick Quarters, Shotley.

Surg. Lt.-Comdrs: F. G. Hunt to Dartmouth on commg. for voyage out and home; H. Hurst to *Carysfort* and to *Carysfort* for voyage out and home; and J. R. Brennan to *Castor* and to *Castor* (on commg.) for voyage out and home.

Surg. Lt. S. Morrow to *Furious* (on recommg.).

Surg. Lt. R. W. Higgins, M.V., to *Pembroke* for R.M. Infirmary, Chatham.

Surg. Lt. (D.) T. E. Brevetor to *Pembroke* for R.N. Barracks, Whatham.

Surg. Comdr. M. W. Mason placed on Ret. List at own request.

Surg. Capt. W. L. Martin to be Surg. Rear-Admiral.

Surg. Lt.-Comdr. H. Wilks to be Surg. Comdr.

Mr. J. K. G. Way, as Surg. Lt., for short service, and appointed to R.N. Hospital, Haslar, for course.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. W. Caithness to *Victory*, for R.N. Barracks, for 14 days' training.

Surg. Sub.-Lt. E. I. Puddy to be Surg. Lieut.

ROYAL ARMY MEDICAL CORPS.

Maj. M. D. Ahern to be Lt.-Col., and remains secd., vice Lt.-Col. R. T. Brown to ret. pay.

Maj. and Bt. Lt.-Col. C. H. Turner to be Lt.-Col., vice Lt.-Col. M. D. Ahern (secd.).

The undermentioned Capts. to be Majs.: A. E. S. Pringle-Pattison (Prov.), with precedence next below H. D. F. Brand, R. H. Alexander, R. W. Galloway, W. Frier, F. S. Gillespie, R. R. G. Atkins (Prov.), W. E. Tyndall, G. A. Bridge.

Capt. (Prov. Maj.) G. R. Grant is restd. to the estabt.

Capt. J. McP. MacKinnon is restd. to the estabt.

Temp. Lt. C. F. McLean relinquishes his commn. and retains his rank.

J. F. Wilde to be temp. Lt.

TERRITORIAL ARMY.

The King has approved of the following appointment:—To be Honorary Surgeon to His Majesty: Col. Frederic H. Westmacott, C.B.E., T.D., F.R.C.S., Assistant Director of Medical Services, 42nd (East Lancs.) Division, in succession to Col. E. C. Montgomery-Smith, C.M.G., D.S.O., T.D., M.D. (Retd.).

Maj. (Prov.) J. A. Stenhouse is confirmed in his rank.

R. McD. Cairns, late R.N.V.R., to be Lt.

D. S. Middleton to be Lt.

General List.—Qrmr. and Capt. D. T. Dixon retires on account of ill-health and retains his rank.

ROYAL AIR FORCE.

Group Capt. A. W. Iredell to Headquarters, Inland Area, Stanmore, for duty as Principal Medical Officer.

Flying Officers W. W. Coffey and J. Hutchieson to Research Laboratory and Medical Officers' School of Instruction on appointment to Short Service Commissions.

Flight Lt. (Dental) H. J. Procter to No. 5 Flying Training School, Sealand.

Medical Quartermaster and Flying Officer C. B. Willsher is placed on the retired list on account of ill-health.

INDIAN MEDICAL SERVICE.

The King has approved the grading of the undermentioned officer with seniority as shown below in supersession of all previous notifications: Capt. (Prov.) W. Aitchison (June 20th, 1924.)

Temp. Lieuts. to be temp. Capts.: Dina Nath Ahluwalia, Bhann Datta Sharma, Manmohan Nath Khanna.

Surg. Lt.-Comdr. S. R. Johnston, R.N., has been awarded Sir Gilbert Blane's Gold Medal, he having obtained the highest aggregate marks at the examinations held in 1926 for promotion to the rank of Surgeon Commander.

Medical News.

PROGRESS OF THE LONDON HOSPITALS.—The annual reports of several more of the London hospitals have just been issued:

Royal Free.—For seven months of last year 54 of the 248 beds were not available owing to alterations in the wards, but 2504 in-patients were treated at an average total cost of £9 16*s.* 9*d.* each. There were more than 32,000 casualty cases. Six small rooms for the use of private patients of limited means were opened and have been in constant use. Also, two small wards for venereal, obstetric, and septic obstetric cases have been opened, together wih a maternity clinic in Essex-road, Islington. Lord Riddell lent 50·35 mg. of radium. The ordinary expenditure exceeded the ordinary income by £17,610.

Brompton Hospital for Consumption.—Last year 2535 in-patients were treated at a cost of £23 2*s.* 1*d.* each, and there were 4088 new out-patients. Of the 476 beds available 449 were constantly occupied. The hospital at Brompton cost over £60,000 and the Frimley Sanatorium over £20,000 to maintain. A new wing of the hospital, with X ray rooms, is being provided at a cost of £25,000 (which has not yet been obtained) as a memorial of the late Lord Cheylesmore who was chairman for 21 years.

St. Mary's, Paddington.—There were 4143 in-patients, and the average cost per occupied bed was £163, as compared with the average of £184 of the hospitals which come within the purview of King Edward's Fund. The annual subscriptions were the largest since 1911, but were still "almost absurdly low."

Seamen's Hospital.—The 105th annual report of the Seamen's Hospital Society states that since the foundation of the Society 1,100,000 persons have been treated at the parent hospital at Greenwich, about one-fifth of whom were in-patients. There were last year 3168 in-patients at the "Dreadnought" Hospital at Greenwich who cost a fraction under £11 each. The Society possesses three other hospitals, including the Hospital for Tropical Diseases in Endsleigh-gardens, a sanatorium, a convalescent home and a dispensary, with a total of 542 beds. The income last year exceeded expenditure by more than £9000.

HEALTH OF BELFAST.—Dr. H. W. Bailie's report for the year 1925 records the number of births registered in the city as 10,234, equivalent to a birth-rate of 23·4 per 1000. This is a decrease of 0·5 per 1000 compared with the previous year. In the preceding ten years, 1915–24, the average annual birth-rate was 25·1. The number of deaths registered was 6131, equivalent to a death-rate of 14 per 1000, a decrease of 0·3 per 1000 compared with the previous year. The average number of deaths for the ten years 1915–24 was 6829, being an average death-rate of 16·7. The number of deaths under 1 year of age was 1069, being 17·4 of the total deaths registered. This represents a decrease of 3 per 1000 compared with the preceding year. 1738, or 28·35 per cent., of the total deaths registered were caused by chest diseases, 575 being due to phthisis, 517 to pneumonia, and 646 to other diseases of the respiratory system. Zymotic diseases accounted for 574 deaths, or 9·36 per cent. of the total deaths registered. 203 of these deaths were caused by diarrhœa, 99 by whooping-cough, 167 by measles, 49 by scarlet fever, 38 by diphtheria, and 18 by typhoid fever. The death-rate from phthisis was 1·3 per 1000 of the population, from pneumonia 1·2, and from other diseases of the respiratory system 1·5, showing a decrease of 0·1 from phthisis, of 0·2 from pneumonia, and of 0·1 from other diseases of the respiratory system. The death-rate from zymotic diseases was 1·3, an increase of 0·3 compared with the preceding year. This increase was due to diarrhœa, measles, and typhoid fever. The deaths from typhoid fever numbered 18, compared with 3 in the preceding year, an outbreak of the disease being due to infected milk sent into the city from a dairy situated outside the city. No case of typhus fever or of small-pox occurred during the year. The case mortality of scarlet fever was 3 per cent. and of diphtheria 10·3 per cent. There were 8 cases of encephalitis lethargica, of which 7 proved fatal. The deaths from this disease in the previous year numbered 30. No case of cerebro-spinal meningitis or of poliomyelitis occurred during the year. 299 samples of fresh milk were examined for tuberculosis, and 17 of these (5·7 per cent.) were found to be infected. In such cases steps are at once taken to prohibit the sale of milk from the infected farm until the dairy herd has been examined by the veterinary inspector of the district and the source of infection has been traced.

INDUSTRIAL WELFARE SOCIETY.—At the seventh annual lecture conference which opens to-day (Friday) at Balliol College, Oxford, and continues until Wednesday, Sept. 15th, lectures will be given by Mr. H. A. Mahony on Dental Service in Industry, and by Dr. Innes H. Pearse on the Future of Preventive Medicine in Industry, when Dr. M. L. Dobbie Bateman will preside. Mr. Ralph C. Hazell will give Some Experiences and Results of Welfare Work.

ROYAL ALBERT EDWARD INFIRMARY, WIGAN.—The report for the year ending March 31st, 1926, reports that the number of beds is not nearly sufficient to meet the demands of the large area served by the institution; the waiting-list numbers 150, of whom 80 are women. The 3058 in-patients who were treated to a conclusion were an increase of a patient a day over the previous year. Of the total expenditure of £42,000, £1650 was derived from employees' contributions.

FRENCH HEALTH RESORTS.—For many years Mme. Juppé-Blaise had charge at the Office Français du Tourisme of a bureau, conducted in the interests of medical men desiring information concerning the French spas. Mme. Juppé-Blaise is now opening an office of similar scope in premises adjacent to the British Medical Association headquarters, and informs us that for the present inquiries about hotels, prices, and travelling arrangements can be directed to her, care of the Financial Secretary, B.M.A.

ALL RUSSIAN OPHTHALMOLOGICAL CONGRESS.—The main items in the programme of this Congress, which will be held in Moscow from Sept. 27th to 30th, are: 1. Organisation of Medical Help in Eye Diseases: Measures of Fighting and Preventing Blindness. 2. Trachoma and its Prevention. 3. Chronic Eye Diseases: Methods of Diagnosis and Scientific Investigations. 4. Individual Scientific Communications. Further information may be obtained from Dr. V. N. Polovtsev at the offices of the Red Cross Society of Russia, 150, Southampton-row, London, W.C. 1.

MATERNAL MORTALITY AND MORBIDITY IN AMERICA.—A national programme for the prevention of maternal mortality and morbidity throughout the United States is outlined by the Children's Bureau of the U.S. Department of Labour in a report on maternal mortality made public on August 30th. The report is the work of Dr. Robert Morse Woodbury, formerly director of statistical research for the Children's Bureau. Dr. Woodbury estimated that the total annual number of maternal deaths in the United States is more than 20,000. Comparison of the United States rates of maternal mortality with those of other countries shows that the United States ranks among those having the highest rates, such as New Zealand and Chile. Analysis of the causes of maternal deaths in that country shows that the most important single cause is puerperal septicæmia; puerperal albuminuria and convulsions are among other causes noted, also accidents of pregnancy and labour and hæmorrhage. Colour and nationality are also important factors. In the report the preventability of maternal mortality is considered in the light of the analysis of causes and causal factors. It is held that almost all the mortality from puerperal septicæmia is preventable by the rigorous observance of asepsis. For the prevention of the most important causes of maternal deaths the essential recommendations by the bureau are: Effective supervision by a public health agency over hospitals and over the training and admittance to practice of physicians, midwives, and nurses, and the requirement that all cases must be reported. It is considered that other puerperal causes of death may be prevented in a large proportion of cases by proper prenatal and natal care of the mother. The problem of prevention is therefore summarised by the Children's Bureau report as that of ensuring to every mother skilled assistance before and during childbirth. A preventive programme is suggested by the report, of which the main outlines are as follows: (1) Regulation of the practice of obstetrics by requiring a licence to practise from both physicians and midwives, by establishing minimum requirements for obtaining such a licence, and by defining and prescribing penalties for malpractice. (2) Regulation of public and private hospitals and maternity homes through legal provisions governing the establishment of such institutions, which should be licensed and subject to inspection. (3) Legislation for the control of venereal diseases, including the making of these diseases notifiable. (4) Requiring that puerperal septicæmia be made notifiable, as is now the case in a number of States. (5) Provision through Governmental or public sources of better facilities for training medical and nursing personnel and more adequate clinics, hospitals, and maternity homes. (6) Subsidies in aid of State or local activities by Federal or State governments. (7) Educational work directed toward informing mothers of the need of adequate maternity care.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—An interesting programme of lectures has been arranged for the forthcoming session, beginning Oct. 4th. In the Michaelmas term the Hon. Bertrand Russell will give two courses of lectures: (1) on the Problems of Philosophy, (2) on Mind and Matter; Dr. T. W. Mitchell will deliver ten lectures on Medical Psychology; Prof. G. Dawes Hicks will deliver ten lectures on the Development of Philosophy since Kant; and Prof. C. W. Valentine a course of 20 lectures on General Psychology. In the Lent term Dr. C. Delisle Burns will lecture on the Philosophy of Social Life, and Prof. J. S. Mackenzie on Social Values. A full syllabus of lectures can be obtained on application to the Director of the Institute, 88, Kingsway, London, W.C. 2.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE HOSTEL, Imperial Hotel, Russell-square, W.C. 1.

MONDAY, Sept. 13th.—9 P.M., Sir William Hale-White, K.B.E., F.R.C.P., will open a discussion on The Days of Richard Bright.

FRIDAY, Sept. 17th.—9 P.M., Mr. E. Muirhead Little, F.R.C.S., will open a discussion on Amputation Stumps.

All medical practitioners cordially invited.

Appointments.

New Sussex Hospital for Women and Children, Brighton: COOK, BESSIE E., M.B., Ch.B. Lond., has been appointed Temporary Honorary Assistant Anæsthetist, and SYMONDS, V. WINIFRED, M.R.C.S., L.R.C.P., has been appointed House Surgeon for a term of six months.

The Chief Inspector of Factories has appointed Dr. R. P. GAMMIE to be Certifying Surgeon under the Factory and Workshop Acts for the Bishop's Stortford District of the County of Hertford, Dr. J. P. MURPHEY for the Pontesbury District of the County of Salop, Dr. F. A. JUCKES for the Horsham District of the County of Sussex, Dr. MARY A. E. SOMERS for the Weston-super-Mare District of the County of Somerset, Dr. F. C. ALTON for the Hollingbourne District of the County of Kent, Dr. R. J. E. CHRISTIE for the Earsdon District of the County of Northumberland, and Dr. N. F. GRAHAM for the Tibshelf District of the County of Derby.

Vacancies.

For further information refer to the advertisement columns.

Ayr County Hospital.—H.S. At rate of £100.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Bristol General Hospital.—Sen. Res. M.O. £200.
Cancer Hospital, Fulham-road, S.W.—Clin. Asst. £250.
Cardiff, Prince of Wales Hospital.—H.S. £160.
Cardiff Royal Infirmary.—Ophth. H.S. At rate of £50.
Dewsbury and District General Infirmary.—H.S. £200.
Dublin, St. Vincent's Hospital.—Asst. S. to Out-patient Dept.
Edinburgh, Royal Mental Hospital, Morningside.—Asst. M.O. £350.
Evelina Hospital for Children, Southwark, S.E.—H.P. £120.
Greenwich, Dreadnought Hospital.—H.P. and H.S. Each at rate of £110.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each at rate of £50.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. £100.
Lancashire Asylums Board.—Pathologist. £1000.
Leamington Spa, Warneford General Hospital.—Res. H.S. £150.
Leicester, Isolation Hospital and Sanatorium, Groby-road.—Res. M.O. £350.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
London Homœopathic Hospital, Great Ormond-street, W.C.—Res. M.O. £100.
Macclesfield, Parkside Mental Hospital.—Res. Clin. Asst. £75.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester, Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125. Also Res. Clin. Asst. At rate of £50.
Mount Vernon Hospital for Diseases of the Chest, Northwood, Middlesex.—Res. M.O. At rate of £250.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.
Nottingham General Hospital.—Res. Cas. O. At rate of £200.
Oswestry, Shropshire Orthopædic Hospital.—Two H.S.'s. £150.
Plymouth Homœopathic and General Hospital.—H.S. At rate of £100.
Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s and H.P. Each at rate of £120. Also Jun. H.S. and Jun. H.P. At rate of £90 each.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal London Ophthalmic Hospital, City-road, E.C.—Two Refraction Assts. Each £100. Also Asst. S.
Royal Northern Hospital, Holloway, N.—Obstet. H.S. Also H.S. Each at rate of £70.
St. Helens County Borough.—Asst. M.O.H. £650.
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. Asst. P. Also Clin. Asst.
Salford City.—Bacteriologist. £600.
Salford Royal Hospital, Manchester.—H.S. At rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. and three H.S's. Each at rate of £50.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non. Res. H.S.'s. At rate of £150 and £100 respectively. Also Hon. Asst. S. 100 guineas.
West-End Hospital for Nervous Diseases, Regent's Park, N.W.—Jun. H.P. At rate of £100.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Newhaven, in the County of Sussex, at Thame, in the County of Oxford, and at Measham, in the County of Leicester.

The Home Secretary gives notice that in consequence of the resignation of Col. Albert Herbert Tubby, C.B., C.M.G., one of the Medical Referees under the Workmen's Compensation Act for the District of Clerkenwell County Court (Circuit No. 41), the appointment held by him is vacant. Applications for the post should be addressed to the Private Secretary, Home Office, Whitehall, S.W. 1, and should reach him not later than Sept. 30th, 1926.

Births, Marriages, and Deaths.

BIRTHS.

CALWELL.—On Sept. 1st, at Holland Park-avenue, W., the wife of W. K. Calwell, M.D., D.P.H., of a son.
CRONIN.—On Sept. 1st, at Westbourne-grove, W., the wife of A. J. Cronin, M.D. Glasg., M.R.C.P. Lond., D.P.H., of a son.
DODD.—On Sept. 1st, at The Red House, Dartmouth-grove, Blackheath, S.E. 10, the wife of Dr. Fredk. H. Dodd—a son.
FOULKES.—On Sept. 3rd, at Exeter, the wife of R. K. Foulkes, M.B., B.S. Lond., of a daughter.
HINE.—On Sept. 6th, at Rossmore, Harpenden, the wife of Montague Hine, F.R.C.S. of a daughter.
HORDER.—On Sept. 6th, at Findelen, London-road, Tunbridge Wells, the wife of Cecil A. Horder, F.R.C.S. of a daughter.
NICHOLSON.—On Sept. 7th, at a nursing home, Leeds, the wife of Dr. James Nicholson, Riffa House, Liversedge, of a son.
VINT.—On Sept. 2nd, at Oaklands, Langton Green, Tunbridge Wells, the wife of Morley Dyson Vint, M.A., M.B., B.Chir. Cantab., of a son.

MARRIAGES.

ANDERSON—ALLEN.—On Sept. 1st, at St. Mary's, Comber, Co. Down, William Arthur Anderson, M.A., M.D., to Phebe Elizabeth, only daughter of Mr. and Mrs. Allen, Unicarval, Comber, Co. Down, N. Ireland, and The Elms, Iffley, Oxford.
GROSS—KUTNER.—On August 10th, Malcolm Gross, M.B., B.S. Lond., D.P.H., of Wolverhampton and Clapham, S.W., to Adelaide Kutner, of Hampstead.
MOSELY—SPURR.—On August 24th, at St. Marylebone Register Office, Frederick Maurice Mosely, B.A. Cantab., M.R.C.S., L.R.C.P., of London, to Stella Margaret, second daughter of Dr. Frederick Spurr, of London and Hove, Sussex.
SCOTT—HOPKIN.—On Sept. 2nd, at Paddington, John A. A. P. Scott, L.R.C.P. Lond., M.R.C.S. Eng., of Tottenham, to Gladys M. Hopkin, of Tottenham.
WARE—HOPPER.—On August 31st, quietly, at Wimbledon, Sydney Arthur Thomas Ware, M.R.C.S. Eng., L.R.C.P. Lond., of the Sudan Medical Service, to Doris Thorne Hopper, of Torquay.
WALSH—LE CREN.—On Sept. 2nd, at the Parish Church, Elmstead Market, Essex, Harold Victor Walsh, M.B., B.Ch., B.A.O. Belf., of Ipswich, to Jeannette de Lisle, daughter of the late F. B. Le Cren.
WILSON—ALLEN.—On August 28th, at York, William Brockie Wilson, M.C., M.B., Ch.B. Glasg., to Mary Young Allen, daughter of Mr. and Mrs. W. Y. Mercer, late of Homeleigh, Gainsboro'.

DEATHS.

BOSTOCK.—On Sept. 4th, at Horsham, Edward Ingram Bostock, M.R.C.S. Eng., L.S.A., J.P., in his 84th year.
DAVENPORT.—On Sept. 4th, suddenly, at Shanghai, Cecil John Davenport, F.R.C.S., Medical Superintendent of the Chinese Hospital, Shantung-road, Shanghai, China, aged 63.
MUMMERY.—On August 30th, at Trevone Bay, North Cornwall, after a short illness, John Howard Mummery, C.B.E., F.R.C.S. Eng., L.D.S., of Albert Bridge-road, S.W., aged 79.
TANNER.—On Sept. 6th, at Eastern Lodge, Kempsey, Worcestershire, Richard Canning Tanner, M.R.C.S. Eng., and L.S.A., 1861, within five days of his 87th birthday.
TONKING.—On Sept. 4th, at Trevu, Camborne, Cornwall, John Herbert Tonking, M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond., aged 62 years.
VAUGHAN.—On August 26th, at Bridgwater, Lieut.-Colonel W. F. H. Vaughan, M.R.C.S. Eng., L.R.C.P. Lond., late R.A.M.C., son of W. Filmer Vaughan.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NOTES ON THE VALUE OF SWISS SANATORIUM TREATMENT.*

BY ALEX. SANDISON, M.B., B.C. CAMB., B.SC. LOND.

THE justification for these notes is the fact that it has been my lot to make two tours of Swiss sanatoria at Montana, Leysin, Davos, Arosa, and elsewhere in the past four years, and during that period I have also had special opportunities for gauging the effect of treatment in Switzerland on a large number of cases of tuberculosis. I have thus been fortunate in having facilities on the one hand for obtaining detailed knowledge of typical sanatoria in Switzerland, and on the other for observing their clinical results on a scale not often available to tuberculosis workers in this country. It is on the basis of this experience that I have formed the opinions I express.

It is a common belief in lay and medical circles that the high altitude, clear air, and sunshine obtainable in Switzerland produce results in the treatment of tuberculosis which are superior to those obtainable in this country. On my first visit in March, 1922, I endeavoured to consider the matter in a strictly impartial way, and on my return felt that there was, on the whole, a balance of evidence in favour of Switzerland, but that it was very difficult to determine whether or not any particular case fell within the class that might expect to obtain peculiar benefit. Since then I have had opportunity to compare over a longer period the progress of cases treated in Switzerland with those who remained in this country. Such comparison does not, so far as pulmonary cases are concerned, show clearly any general superiority of one form of treatment over the other, and in making it I am assuming that the treatment in this country is given in a modern sanatorium situated in a healthy locality, and that the treatment in Switzerland is that provided in a typical Swiss sanatorium at an altitude of 4000–6000 feet.

As the result of my second tour in June, 1925, I am more confirmed in the opinion that Switzerland holds out peculiar advantages only to a limited number of cases, that its special value is largely psychological, and that, leaving aside for the moment surgical tuberculosis, the average case of pulmonary tuberculosis is likely *in the long run* to do as well under appropriate sanatorium treatment in this country as in Switzerland. This conclusion will not be accepted by many Swiss tuberculosis specialists, nor by some in this country. In going round Switzerland one is amused by the unanimity with which the value of altitude treatment is emphasised, whilst at the same time one is told that these beneficial effects are only fully obtainable in the locality and at the altitude of particular sanatoria. One resort is said to be too windy, but it retorts that the other is too dusty. One is too high or too liable to mist, another is alleged to be in a windy valley. In truth all statements may be true, but the implication that climatic conditions are ideal where you happen to have an institution, and deleterious elsewhere, can hardly be accepted, and leads the impartial inquirer to the conclusion that they are all equally good or equally bad.

To my mind the real truth was expressed by the physician of a well-known Swiss sanatorium who said to me: "Treatment in Switzerland is *un traitement de luxe*. Give me a patient to whom time and money are no object, who can, if necessary, live abroad after his treatment, and who is not worried as to ways and means, and I can almost promise to cure him in the course of years. Time is essential, ample funds are essential, for the treatment I give implies the highest standard of comfort and diet. But if the patient has only limited time, if his financial resources are slight he will do better to undergo a more intensive treatment, which he can probably receive equally well in England, and be content with the attainment of relative quiescence of the disease rather than complete cure."

I am increasingly of opinion that this expresses the true value of Swiss sanatoria as curative agents. The idea that Swiss treatment provides a short cut to cure is not correct, nor do I think it true that save for the definite, though often temporary, psychological stimulation usually apparent in the earlier stages of treatment there is any certainty that benefit of a permanent character will result which might not have been obtained elsewhere. In saying this I do not forget certain cases which, for reasons not clearly apparent, have assuredly benefited permanently from Swiss treatment after failing to make progress under other conditions. I know of no certain test, however, by which such cases can be recognised beforehand. Moreover, almost every form of

* Based on a paper read before the Tuberculosis Society.

treatment for tuberculosis, orthodox or unorthodox, can show cases of this kind, and one is inclined to believe that the improvement is a matter of idiosyncrasy rather than of treatment. Certainly no special form of treatment can on such cases alone be considered of generally applicable value.

The following are, to my mind, the main advantages and disadvantages of treatment in Swiss sanatoria—i.e., altitude treatment—for *pulmonary* tuberculosis, as compared with ordinary English sanatorium treatment. I exclude cases obviously unsuitable for altitude—e.g., on account of cardiac defects.

Advantages of Treatment in Swiss Sanatoria.

(1) *Psychological.*—The complete change of scenery and surroundings undoubtedly produces for a time an increased sense of well-being which has a beneficial effect on the pathological condition, but is rarely sufficiently strong or lasting to effect a permanent benefit. With this benefit, due to climatic and scenic change, are often associated the effects of suggestion. The patient has become imbued with the belief that in Switzerland, and there alone, will he regain his health, and the realisation of his wish produces a mental satisfaction which is at least more helpful to his body than the mental unrest of a man who is denied his dearest wish. Again, however, the physical effects of this wish-realisation are not necessarily permanent, and when progress is slow reaction sets in.

(2) *Physical.*—Statistics are so inconclusive that I am inclined to believe that my general impression, based on a detailed acquaintance for some years with the progress of cases treated abroad, is as likely to be correct as any mass of statistics. Be it said at once that many, perhaps most, cases do improve physically at Swiss sanatoria, and their disease tends towards quiescence or even arrest. But so do many and even most treated in good sanatoria at home, especially the early cases. Swiss sanatoria complain that they do not get the cases early enough. So do English sanatoria, the truth being that good sanatorium treatment anywhere will probably produce good results in any early case. Similarly, Swiss sanatoria say they do not have the cases long enough. Given unlimited time, however, English sanatoria are as likely to produce quiescence or arrest as Swiss.

There are, however, cases where English sanatorium treatment has failed to produce quiescence or arrest, the condition becoming one of stagnation in unstable equilibrium; and in certain cases of this type Swiss treatment does produce good results, giving apparently the stimulation required for further and continued progress. This does not apply to all such cases, and it is most difficult to estimate the likelihood of it doing so in any particular case. It is for this type that I think Switzerland does hold out special advantages. Tuberculosis, however, is such an uncertain disease, and sudden improvement occurs in such unexpected conditions, that dogmatism is unwise.

(3) *General Climatic Effect.*—The pure and invigorating air of the Swiss mountains and the large amount of sunshine cannot fail to produce the psychological stimulation I have referred to. Further, the freedom from dust and smoke is an obvious advantage. Certainly a case of tuberculosis is likely to do better in a Swiss sanatorium than in an English town, or in damp, foggy, unhealthy conditions anywhere. To regard an English manufacturing town, with its dust, fog and smoke, narrow streets and cramped houses, as at all comparable with a Swiss mountain resort is obviously ridiculous, yet such is the comparison implied in many arguments on the climatic benefits of Switzerland. The equivalent of Swiss sanatoria is, of course, good English sanatoria in healthy country districts. On such a comparison the final results of treatment, in my experience, are very similar.

Disadvantages of Treatment in Swiss Sanatoria.

(1) *Expense.*—(*a*) *Travelling expenses* are considerable, especially if the patient has to travel as a stretcher case. (*b*) *Nursing* is nominally included in the fixed daily charge, but nursing at a Swiss sanatorium is a very different thing from what the Englishman is accustomed to and expects. The ordinary Swiss sanatorium nurse has not the training of our nurses, and the proportion of nurses to patients is much smaller than with us. In short, for anything beyond quite simple nursing and domestic service there is little provision in the English sense, and a patient with, for example, a severe hæmoptysis or other condition requiring frequent skilled nursing has to engage a special nurse at considerable additional cost. Thus, the expenses of treatment may speedily mount to a very high figure, especially when removal to a less expensive place of treatment is impossible or dangerous owing to distance and the acuteness of the disease. Certain sanatoria run by English doctors with English nurses on English lines must be excepted from these remarks on nursing. (*c*) *Medicines* are invariably charged extra. Swiss chemists are a close corporation, with special privileges. It is, I understand, illegal for a doctor in a sanatorium to dispense any drugs other than what is necessary in emergencies. Thus, the chemists have a strong monopoly and charge accordingly. (*d*) *General.* Swiss sanatoria are usually commercial concerns. So, of course, are English private sanatoria, but there are degrees of efficiency in the detection of items on which additional charges may be made, and in Switzerland these items, though individually small, may amount to a surprising total in the monthly bill. (*e*) *Kurtaxe.* This local tax may amount to 6*d.* or 1*s.* a day.

These sources of extra expense could be regarded with more equanimity if there were more certainty of special advantage in return. For the rich they are unimportant, but to the average tuberculous patient these extra charges often produce a financial anxiety which may go far to counteract what special benefits there are in Swiss treatment. Their extent, moreover, is not usually realised before the patient has embarked on the treatment and they often come as a serious shock.

(2) *Diet.*—Swiss sanatoria naturally diet their patients according to continental standards and customs. Breakfast is a "café complet"; lunch and dinner are rather heavy meals, with a predominance of oily ingredients and made-up dishes with a wearisome reiteration of veal as the staple meat. This is a welcome change for most of us when we go abroad on holiday, but as a continued diet for an Englishman, and especially a sick one, it often becomes wearisome.

I was informed by one medical superintendent that his diet scale was worked out with the greatest accuracy as to the "calorie value" necessary for high altitudes. That may be true enough, but calories are not everything, and food taken without appetite, and even with repugnance, does not get sufficiently digested to be fully assimilated. This diet question is one of special importance to the patients who have to be in bed and get no exercise. I came across several instances where the patient was justifiably weary of a diet which, though ample in amount, was foreign to his tastes and customs and not sufficiently modified according to the condition of his disease. These remarks do not apply with the same force to the English run sanatoria mentioned in (1) (*b*) above, where the diet is much more like that of English institutions.

(3) *Alcohol.*—Swiss sanatoria lay great stress on forbidding smoking to their patients, but permit considerable use of wines, beer, and even spirits. English sanatoria take the opposite view. The sale of alcoholic liquors is, moreover, a source of revenue to Swiss sanatoria. I was told by one medical superintendent that his committee had called attention to the diminishing receipts on this account. The medical superintendent had rightly retorted that he was glad they were less, but the incident shows a conflict of aim between the management and the medical superintendent of the sanatorium.

Further, there are no licensing restrictions abroad comparable to ours, and it is ridiculously easy for a patient to get what alcohol he likes and when he likes outside, and, I fear, it is at times too easily obtained within the sanatorium itself. Thus, any patient who has a tendency to alcoholic indulgence is usually subjected to considerable temptation. English sanatoria have, of course, their own difficulties with the alcoholic, but in general it may be said that the opportunities for alcoholism are much less in England, and the attitude one of more active discouragement.

(4) *Discipline.*—Englishmen do not take kindly to foreign control and the foreigner does not usually know how to handle the Englishman. Hence, there are always possibilities of trouble, for there is not the same type or method of discipline in Swiss sanatoria and the headstrong patient is more likely to run amok. The development of fashionable winter sports near Swiss sanatoria is an obvious potential source of disciplinary trouble.

(5) The *Pension System.*—Apart from sanatoria where there is a resident medical staff, there are numerous so-called sanatoria at Leysin, Davos, Arosa, &c., which are simply boarding houses catering more or less exclusively for tuberculous persons. These "pensions" vary greatly in quality of accommodation—some are almost of sanatorium standard, others cramped and unsatisfactory. The charges are, on the whole, high, but do not include any medical or nursing attendance, such being separately arranged for, usually with a local doctor, who is more or less directly attached to the "pension." There is rarely any control of the patient, who is practically as free as if he were in his own home. These "pensions" cannot be regarded, without careful inquiry, as at all equivalent to sanatoria, and their prospectuses give but a very partial indication of their nature.

(6) *Declimatisation.*—By this I mean that prolonged treatment in Switzerland *declimatises* the patient for life and work in this country. Swiss doctors will advocate more or less continuous residence and treatment in Switzerland for two, three, or more years. The result is that the patient comes to believe that he must always fly to Switzerland to avoid the

English winter and, in fact, he does find it harder to keep well in England, although his general condition may have been much improved.

For the average tuberculous patient it is an obvious advantage to receive his treatment in climatic conditions broadly similar to those in which he has eventually to return to work. The less climatic difference there is between the place of treatment and cure and the place where work can be recommended the more lasting the cure will be. This is in itself a general argument against prolonged Swiss treatment, for to become acclimatised to altitude is to become *de*climatised to English conditions and makes resumption of work so much the harder and the more precarious.

Thus, whilst a single year or 18 months in Swiss altitudes need not produce any serious declimatisation, continuous treatment there beyond that period, or regular return throughout each winter for several years, makes it more and more impossible for the average quiescent type of case ever to resume steady work in this country. Once again, Swiss treatment is suitable for the man of independent means who can live where he likes, when he likes, but has its dangers for the average man who has to work for his living.

Surgical, Non-Pulmonary Tuberculosis.

So far my remarks have had reference to the treatment of pulmonary tuberculosis. The value of treatment in Switzerland for surgical tuberculosis requires separate consideration.

There is ample evidence to show the directly beneficial effects of altitude and sun treatment on surgical tuberculosis. The climate of this country cannot provide light and sun to the same extent. On the other hand, the recent developments of artificial light treatment already demonstrate that curative results can be produced by artificial heliotherapy, and the work of Sir Henry Gauvain at Alton teaches us not to disparage unduly our own climate. Perhaps the special advantages of Switzerland for surgical tuberculosis are already to a considerable extent capable of reproduction in a "light department." Such artificial heliotherapy is, indeed, often given as an addition to the natural light treatment in Swiss sanatoria, for the sun does not always shine there. It is as yet too early to say how far the "Alpine sun" lamp can rival the Alpine sun itself, but it is equally too early to deny its potentialities.

The psychological advantages of Switzerland, previously alluded to, hold good in surgical as in non-surgical tuberculosis, and so for that matter do the general disadvantages except that the average nursing provision for surgical cases is of a higher standard but often at an extra cost.

The present position seems to me to be as follows: (1) Swiss treatment has real and specific value for surgical tuberculosis. (2) This specific value can apparently be also obtained from artificial light treatment in this country. (3) If artificial light treatment is available, therefore, it should first be given a trial. (4) If the artificial light treatment does not show good results in a reasonable time it is legitimate to consider that the case should go to Switzerland and to anticipate good results there from natural light treatment.

So far I have been considering treatment at altitudes. It is necessary for completeness to allude to:

Cases of Tuberculosis Requiring Sun but not Altitude.

These cases are typically those with severe chronic bronchitis, asthma, and emphysema added to tuberculosis. To them an English winter is undoubtedly likely to bring recrudescence of active disease with a possibility of fatal result. They cannot stand altitude treatment, but they do need warmth, sunlight, and freedom from damp and fog. Thus, they are not suitable for Swiss sanatoria, which are almost invariably situated at considerable altitude, and they can best find the conditions they require on the French or Italian Riviera. Institutional treatment may or may not be necessary, according to the severity of the condition.

MEDICAL MISSIONARY WORK.

IN a little book entitled "A Woman Doctor on the Frontier" (C. of E. Zenana Missionary Society, 1925, 1*s.* 3*d.*), Dr. Charlotte S. Vines has given a series of sketches of medical work as it is carried on in the remote districts of India. Here blood feuds and highway robbery appear to be the chief interests of the people, who die but rarely in their beds. The tales now told emphasise the difficulties under which operations can be performed without untoward results. The same missionary society has published another book, "Flashlights on Chinese Life," which was prepared by the late Dr. Mabel Pantin just before her death. It contains some vivid little snapshots of Chinese life, its pathos and humour, tragedy, and courage. The book is illustrated by a number of photographs and some sketches, and will be welcomed by those who are interested in the life of Eastern peoples and in the efforts of missionaries to improve their physical and spiritual conditions of life.

CIVIL SERVICE BONUS.

THE Ministry of Health gives notice that as from the beginning of the present month the Civil Service bonus will be on the basis of an average cost of living figure of 70. The bonus payable for the six months commencing Sept. 1st, 1926, to officers whose salaries do not exceed £500 a year will therefore be one-eighth less than that payable during the preceding six months. In the case of salaries over £500 a year the bonus will still be subject to the special arrangements made in 1921.

OPHTHALMIC BENEFIT.

ONLY a certain number of the approved societies have adopted the scheme by which their members are entitled to a consultation with an ophthalmic specialist for the fee of one guinea, and since other societies continue to send their members to opticians, it rests with the specialists concerned to make their service so successful that pressure from the members may lead to the general adoption of the scheme. It is essential that the list of specialists should be carefully scrutinised, a task which we believe has so far been efficiently performed. Further, it is essential that the principle of free choice should be maintained, and for this purpose that the insured person should have the opportunity of choosing a specialist from the list. Full use of the scheme implies that no unnecessary difficulty will be put in the way of obtaining the necessary recommendation from the panel practitioner stating the need of advice by an ophthalmic surgeon.

"£2000 REWARD."

THE management of a well-known general hospital has received the following communication addressed "To the Governors."

(*Confidential.*)

TWO THOUSAND POUNDS REWARD.

I will pay this amount to any person who will get me elected as a surgeon upon the staff of a fairly large infirmary. One thousand upon election, the balance at the year end (if I still hold the appointment).

This is a bona fide offer.

I am anxious to become a "specialist." It is impossible, or nearly so, to become a specialist unless elected to a hospital. In a town of county borough size as a minimum as practically all the surgery is done in institutions.

Please use the personal column of the *Daily Mail* under pseudonym of "Lumbar Puncture" in answering in strictest secrecy.

The first inference from the communication is that it is not written by a doctor, for no one conversant with professional work would believe, even if they thought it possible to buy the post, that to be "a surgeon upon the staff of a fairly large infirmary" would ipso facto make the holder of the post a recognised "specialist." On the other hand, the communication may be, despite its odd and unprofessional form, the cry of a disappointed doctor who has some reason to believe that, given the opportunity, he would have made a name for himself as an operating surgeon, but who finds that the public in his particular environment prefer the services of those, possibly his seniors, who are upon the staff of the local hospital. We are familiar with instances where this situation has been a hard one, but we know of no instances where time and proven merit have not come to the rescue.

PUBLIC HEALTH IN THE TONGAN ISLANDS.

A BRITISH protectorate over the Tongan or Friendly Islands was proclaimed in 1900. These islands are situated in the Southern Pacific to the E.S.E. of Fiji and 390 miles therefrom with an area of 385 square miles. The estimated population in 1925 was 25,088, all Tongans with the exception of about 580 Europeans, 240 half-castes, and 370 natives of other Pacific islands. For a long period of years there has been a steady increase in the population; the birth-rate per 1000 in 1924 was 35·9 and the death-rate 18·4. During the year a campaign against hookworm was undertaken. The Board of the Rockefeller Foundation lent the services of an expert for a preliminary survey and to inaugurate the campaign. The native population responded to mass treatment with gratifying results, and a beginning was made in the task of improving the sanitary condition of the villages and the water-supplies. A standard type of fly-proof latrine was adopted and is now being made by the Government for sale to the natives. The village water-supplies, consisting of large concrete cisterns, are being repaired and where necessary enlarged, and measures have been taken to ensure sufficient supplies of clean water. For eight months of the year—from May to November—the thermometer rarely registers higher than 83° F., and, as the humidity is comparatively low during these months, Europeans do not feel the heat to the same extent as in the groups of islands to the north. During the wet season—from December to March—the temperature ranges from 65° to 94°, with a higher humidity. Malaria and other tropical fevers are unknown.